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IRRIGATION DESIGN

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INTRODUCTION

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Overview 2


CHAPTER

1

Overview

This product is part of the professional series of applications available from **Eagle Point**, for use with a full copy of a CAD program.

Irrigation Design runs on MicroStation[®], AutoCAD[®] and IntelliCAD[®], and it also runs as a Stand Alone product.

 *The Stand Alone products offered by Eagle Point Software run on the **Eagle Point Graphics Engine**, which is included with your purchase.*

Users of previous versions may notice some changes. Obviously, the most notable change is using a separate Windows application, rather than functionality built into and limited to CAD. However, there are other fundamental changes, as well. Other features include:

- Drip subsurface command functions
- Mainline hydraulic calculations
- Pipe fitting placement
- Pipe editing tools
- **Quantity Takeoff** linkage

The menu for **Irrigation Design** is shown below.

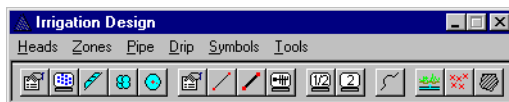


Figure 1-1 Irrigation Design Main Menu

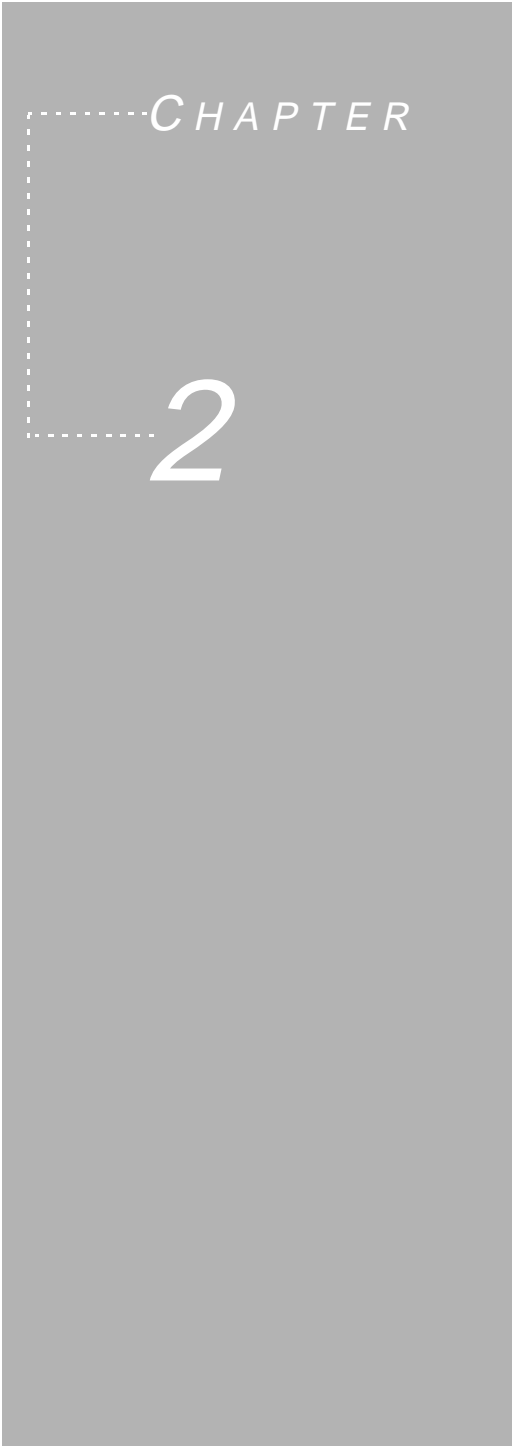
HEADS



Figure 2-1 Heads Menu

In this chapter:

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<i>Head Configuration</i>	9
<i>Automatic Location</i>	10
<i>Locate by Array</i>	14
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Layout Template

IRRIGATION DESIGN ➤ HEADS ➤ LAYOUT TEMPLATE

KEY-IN COMMAND: `irlayouttemp`

The purpose of the Layout Template command is to place a hatch pattern inside an area to be irrigated. This hatch pattern is a template or guideline that you can use when locating sprinkler heads. Since many irrigation designers prefer to locate each individual head, this can provide assistance in ensuring that heads are evenly spaced.

 *Be sure you have a closed polyline/linestring in your CAD graphic before starting this command.*

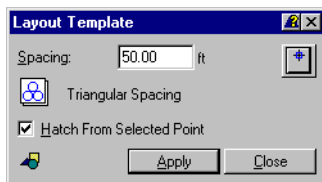





Figure 2-2 Layout Template Dialog Box

Layout Template Dialog Box Definitions

Option	Icon	Function
Spacing		The default distance is determined from the currently selected data file. The spacing is editable via the edit field or PIC button.
PIC		The PIC button allows you to change the spacing.
Triangular Spacing/Square Spacing		You can select between triangular or square. The icon toggle changes from one to the other when you click on it. The default is triangular.
Hatch From Selected Point		When toggled on, this option allows you to select the starting point for the crosshatch.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

QuickSteps

1. Select Heads → Layout Template.

The Layout Template dialog box (above) displays.

2. **Choose either square or triangular spacing by clicking on the icon toggle.**
3. **Verify the spacing between heads or enter a new distance.**

You may enter a new distance by typing a value in the edit field or by putting the cursor in the edit field, clicking on the PIC button, and selecting two points in the CAD graphic.

4. **Click on Apply.**

You are prompted:

Pick point on polyline

5. **Pick a point on the closed polyline.**

You are prompted:

Please select next point for rotation

6. **Pick a point to show the rotation angle of the template pattern.**

You are prompted:

Select any internal islands

7. **Select an internal island (if one exists), otherwise press Enter.**

A hatch pattern is displayed. You are now ready to begin inserting heads at the intersection points of the hatch pattern. You can continue to click on Apply for other areas or click on Close to display the dialog box.

Examples

The following examples are based on the Locate Template CAD graphic shown below using the *QuickSteps* on page 4.

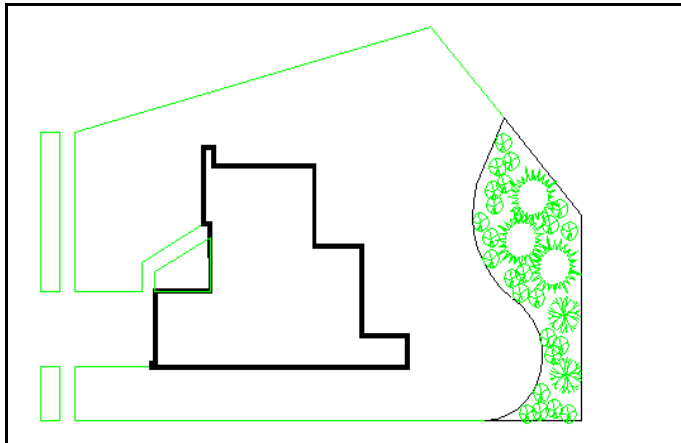


Figure 2-3 *Locate Template CAD Graphic*

Pick the points as shown:

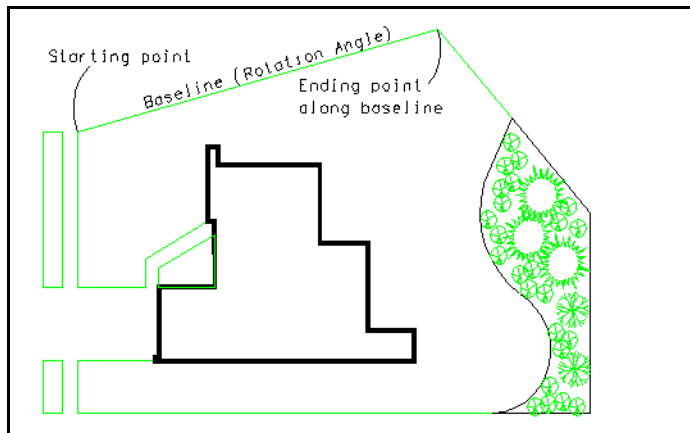


Figure 2-4 *Starting Point and Baseline Example*

The output is displayed as shown:

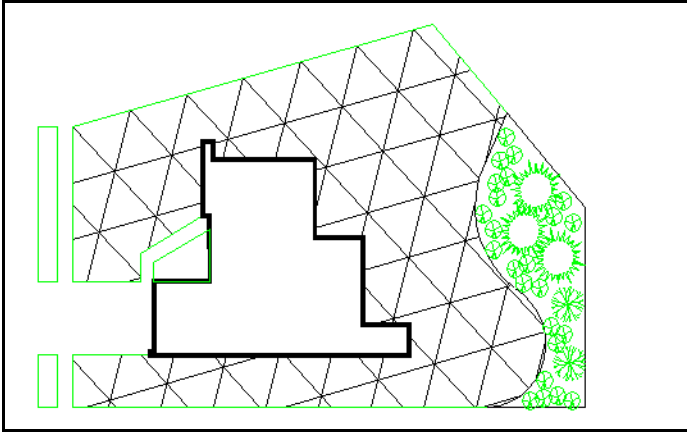


Figure 2-5 Output Example

Notice that because you started the baseline at a specified corner, this is where the hatch pattern started. Because you have an irregular area, it is not possible to get true triangular spacing and have every portion of the turf covered. That is why this is simply a layout template to help you determine where you want to place the heads.

The following figure is a similar output, but with an altered baseline to show how the angle of the template changes.

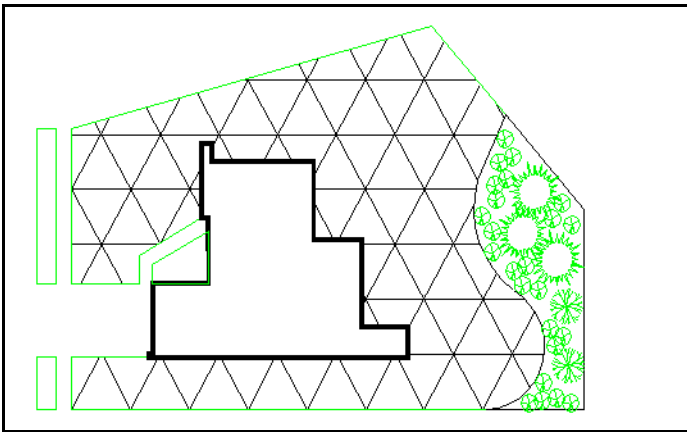


Figure 2-6 Changed Baseline Example

This example shows square spacing.

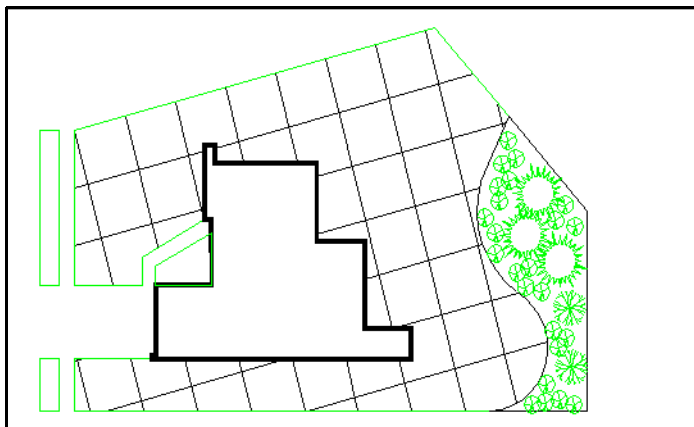


Figure 2-7 Square Spacing Example

Head Configuration

IRRIGATION DESIGN ⇨ HEADS ⇨ CONFIGURATION

KEY-IN COMMAND: `irheadconfig`

This command allows you to set up information associated with head location commands. You are allowed to adjust the settings desired, such as the data file being used, change the data file again, and locate the new heads without closing the dialog box or seeing which sprinklers are currently being used.

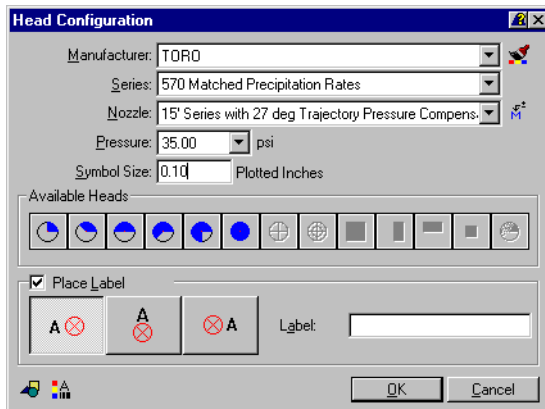




Figure 2-8 Head Configuration Dialog Box

Head Configuration Dialog Box Definitions

Option	Icon	Function
Manufacturer		This is the brand name of the irrigation head.
Match Nozzle Properties		This option allows you to configure your current selection from an existing sprinkler head that has been placed into the design. This is a tremendous time saver when compared to having to reselect all associated information through the Edit Head Database/Head Configuration command.
Series		This is the model number of the irrigation head.
Nozzle		This is the type of the nozzle.
Pressure		This is the operation pressure at the irrigation head.
Symbol Size		The symbol size controls the size of your irrigation head symbol. If you set it at .1, the plotted size is one tenth of an inch in diameter if you are scaled at 1" = 10'.
Available Heads		These are the symbols that are associated with the selected sprinkler head data. See <i>Head Database Editor</i> on page 32.

Head Configuration Dialog Box Definitions

Option	Icon	Function
Place Label		Select this option if you wish to place a label next to each head symbol as it is placed into the CAD graphic. Your options are to place the label to the left, right, or above the sprinkler head.
Label		Text placed in this edit field is the label for the symbol.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This icon enables you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

- 1. Select Heads → Configuration.**
The Head Configuration dialog box (Figure 2-8 on page 9) displays.
- 2. Select your desired nozzle from the appropriate drop lists.**
- 3. Verify the symbol size.**
For most situations, that is all that needs to be set.
- 4. Click on OK.**


Automatic Location

IRRIGATION DESIGN ➤ HEADS ➤ AUTO LOCATE

KEY-IN COMMAND: `irautohead`

ICON: 

The Auto Locate command allows you to locate all the sprinkler heads inside a given area (defined by a closed polyline/linestring) in a single step. Options are provided so that the full circle (360°) heads can be placed separately from the part circle (edge) heads, giving you the option to change sprinklers or nozzles if desired. You maintain control over what type of sprinklers you want to use, the type of spacing (triangular or square), and the distance between the heads. The program selects the best location for the sprinklers. In most cases, you modify the suggested layout in order to achieve optimum coverage, but for many applications, this command can greatly speed up the initial placement of sprinklers.

 Be sure you have a closed (unsplined) polyline/linestring in your CAD graphic prior to running this command.

Evenly-spaced heads occur by using an optimizing routine that determines how to best fit all heads in an area so they are an equal distance apart, regardless of the base pattern of square or triangular spacing.

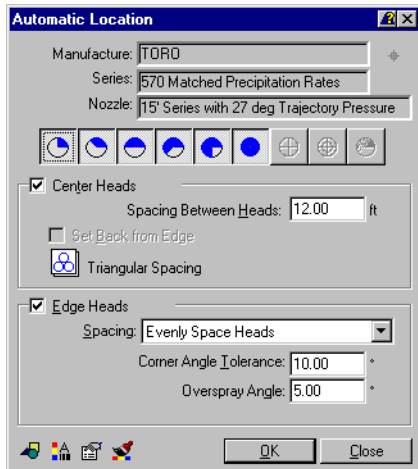








Figure 2-9 Automatic Location Dialog Box

Automatic Location Dialog Box Definitions

Option	Icon	Function
Manufacture		This is the brand name of the irrigation head.
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Series		This is the model number of the irrigation head.
Nozzle		The information in this section shows the current head type, nozzle, and pressure in use, what arcs are defined for that data file, the current symbol set being used, and what symbols are defined for that set. If you wish to change any of this information, you may click on the Head Configuration icon.
Pattern		These icons show the available coverage for the irrigation heads.
Center Heads		Toggle on this option to place irrigation heads in the middle of the defined area.
Spacing Between Heads		This value defaults from the radius defined in the selected data file and can be changed.
Set Back from Edge		When enabled, this keeps the head coverage within the boundary.

Automatic Location Dialog Box Definitions

Option	Icon	Function
Triangular Spacing/Square Spacing		Choose a method of layout – square or triangular – by clicking on this icon toggle. <ul style="list-style-type: none"> ➔ Triangular: An offset pattern ➔ Square: A square, spaced pattern
Edge Heads		Toggle on this option to place irrigation heads on the perimeter of the defined area.
Spacing		Select one of these options from the drop list: <ul style="list-style-type: none"> ➔ Place Heads by Distance: This option keeps the default spacing between heads. ➔ Evenly Space Heads: This option spaces the heads in a best fit or uniform spacing.
Corner Angle Tolerance		This setting allows you to account for or ignore multiple line segments in the defining element. This option also allows the software to compensate for short line segments that were inserted instead of curves.
Overspray Angle		The overspray angle refers to when the program should move to the next spray angle. For example, if you have a corner that is set at 94 degrees, you need to let the program know if you should use a 90-degree spray head in that corner, or jump to a 105-degree spray head. If the overspray angle is set to 5, you would still use a 90-degree head up to 95 degrees.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.
Head Configuration		This icon allows you to change information for the irrigation head.
Match Nozzle Properties		This option allows you to configure your current selection from an existing sprinkler head that has been placed into the design. This is a tremendous time saver when compared to having to reselect all associated information through the Edit Head Database/Head Configuration command.

QuickSteps

- 1. Select Heads → Auto Locate.**
The Automatic Location dialog box (Figure 2-9 on page 11) displays.
- 2. Verify the spacing between heads, spacing method, and overspray angle.**
- 3. Toggle on the appropriate options to locate Full Circle Heads and/or Edge Heads and click on OK.**
- 4. In the CAD program, select a closed polyline/linestring and show a base rotation angle.**

Example

Here is the base CAD graphic to use to locate the auto heads in this example based on the *QuickSteps* on page 12.

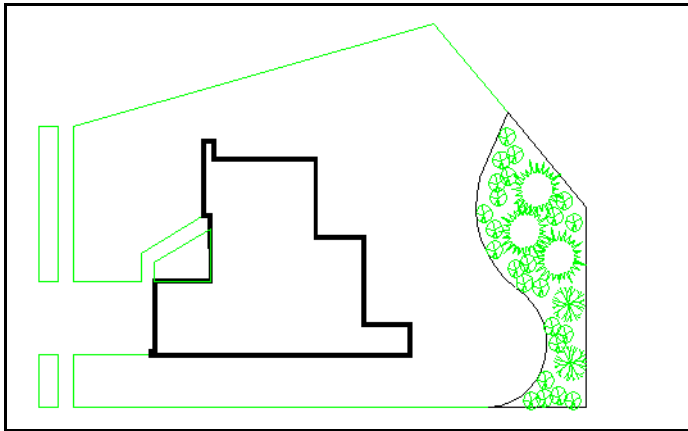


Figure 2-10 Auto Heads Base CAD Graphic

Pick the points as shown below.

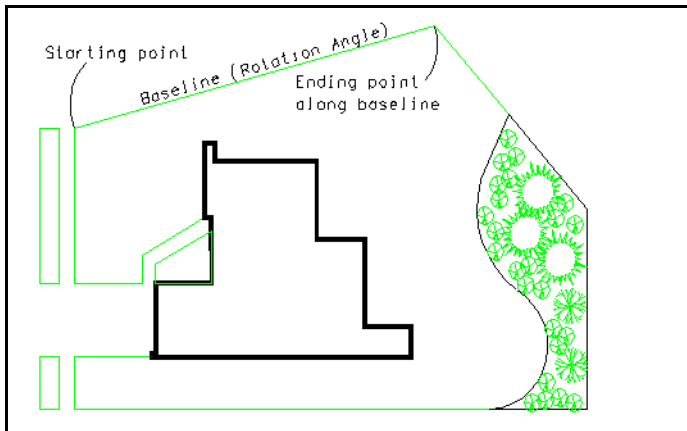


Figure 2-11 Starting Point and Baseline Example

The output is displayed as shown below.

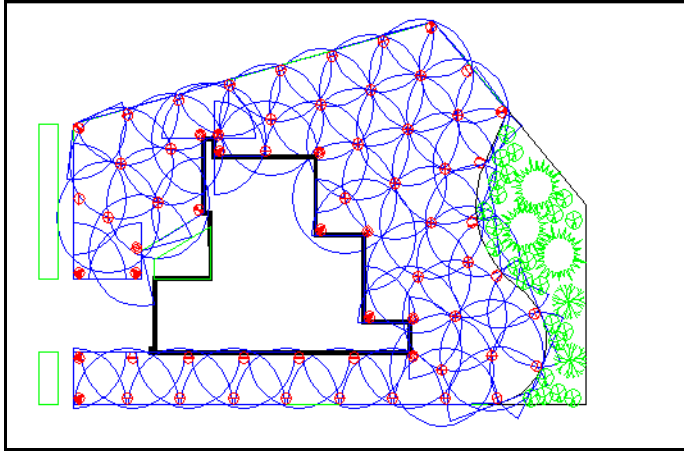


Figure 2-12 Output Example

Notice how the base angle affects the spacing, just as it did with the Layout Template command. Also notice that it is possible to get imperfect coverage.

Locate by Array

IRRIGATION DESIGN ➤ HEADS ➤ LOCATE BY ARRAY

KEY-IN COMMAND: `irarrayhead`



ICON:

The Locate by Array command allows you to array a sprinkler in order to get multiple copies of that sprinkler over a large area (similar to the AutoCAD/IntelliCAD/**Eagle Point Graphics Engine** Array command). The AutoCAD/IntelliCAD/**Eagle Point Graphics Engine** Array command only gives rectangular copies of the objects selected, and irrigation designs are frequently done with triangular spacing. This saves you from having to manually locate a large number of sprinklers. Both the coverage arc and symbol are located. This is similar to the automatic head location, but areas to be covered by an array must be rectangular (or heads must be added or erased after placement).

Basically, you are requesting two points in order to define the angle at which to array the sprinklers.

- ✎ When running this command, you must not have previously located a head – this command inserts all of the arrayed heads, including the first one.

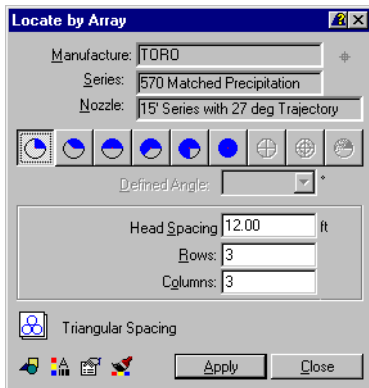




Figure 2-13 Locate by Array Dialog Box

Locate by Array Dialog Box Definitions

Option	Icon	Function
Manufacture		This is the brand name of the irrigation head.
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Series		This is the model number of the irrigation head.
Nozzle		The information in this section shows the current head type, nozzle, and pressure in use, and the current arcs and symbol being used. If you wish to change any of this information, you may click on the Head Configuration icon.
Pattern		This shows the available head coverage.
Defined Angle		Choose from a list of intermittent angles not offered in the pattern set.
Head Spacing		This value defaults to the radius of the current selected sprinkler data file. You can edit this value.
Rows		This is the number of rows of irrigation heads.
Columns		This is the number of columns of irrigation heads.
Triangular Spacing/Square Spacing		Choose a method of layout – square or triangular – using this icon toggle. <ul style="list-style-type: none"> ➡ Triangular: An offset pattern ➡ Square: A square, spaced pattern
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the drawing.

Locate by Array Dialog Box Definitions

Option	Icon	Function
Head Configuration		This is used to change the sprinkler head information.
Match Nozzle Properties		This option allows you to configure your current selection from an existing sprinkler head that has been placed into the design. This is a tremendous time saver when compared to having to reselect all associated information through the Edit Head Database/Head Configuration command.

QuickSteps

1. **Select Heads → Locate by Array.**
The Locate by Array dialog box (Figure 2-13 on page 15) displays.
2. **Verify the spacing distance and spacing method in the dialog box.**
3. **Enter the number of rows.**
4. **Enter the number of columns and click on Apply.**
5. **Show the location of the first head by picking a point in CAD, then show a base angle for the rows by picking in CAD again to indicate the direction.**

Example

Following is an example that shows how the Locate by Array command functions. Notice that this is not dependent upon a specific area with a bounding polyline like it is in the Auto Locate command.

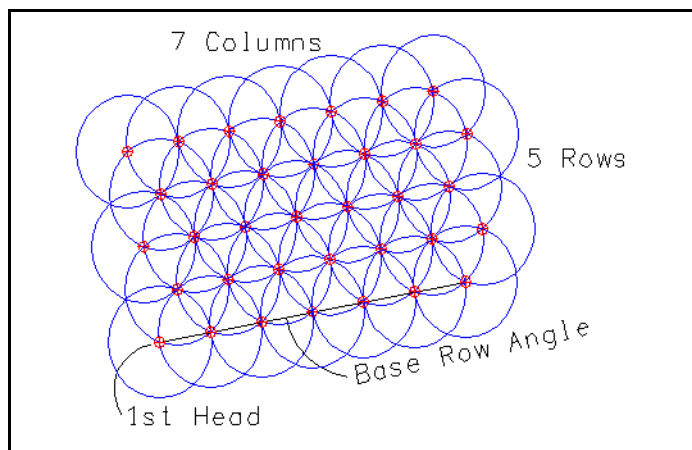


Figure 2-14 Locate by Array Example

Locate on Edge

IRRIGATION DESIGN ➤ HEADS ➤ LOCATE ON EDGE

KEY-IN COMMAND: i redgehead



The Locate on Edge command allows you to place part-circle sprinklers along the edge of a turf area.

This command follows a polyline/linestring and locates specified heads along the specified side based on the information given in the Locate on Edge dialog box (below).

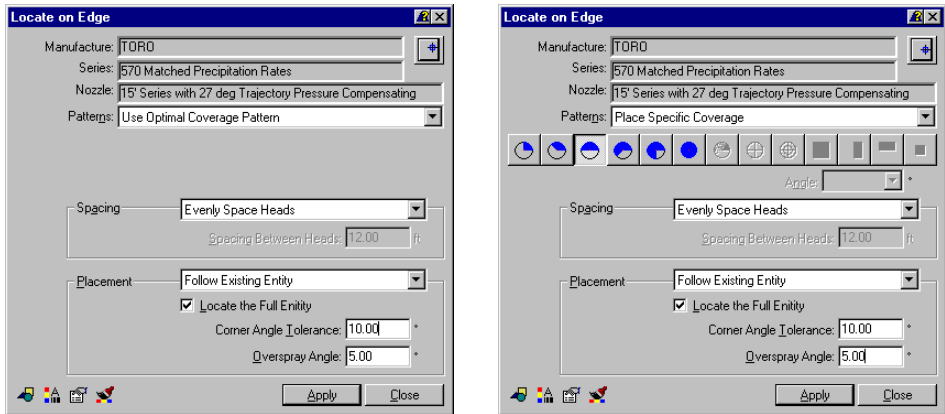







Figure 2-15 Locate on Edge Dialog Box

Locate on Edge Dialog Box Definitions

Option	Icon	Function
Manufacture		This is the brand name of the irrigation head.
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Series		This is the model number of the irrigation head.
Nozzle		The information in this section shows the current head type, nozzle, and pressure in use, and the current arcs and symbol being used. If you wish to change any of this information, you may click on the Head Configuration icon.
Patterns		This shows the available head coverage.
Angle		This drop list allows you to select coverage arc angles.

Locate on Edge Dialog Box Definitions

Option	Icon	Function
Spacing		<p>Select one of these options from the drop list.</p> <ul style="list-style-type: none"> ➡ Place Heads by Distance: This option keeps the default spacing between heads. ➡ Evenly Space Heads: This option spaces the heads in a best fit or uniform spacing.
Spacing Between Heads		This option allows you to type in a multi-segmented polyline/linestring.
Placement		<p>Select one of the following options from the drop list.</p> <ul style="list-style-type: none"> ➡ Follow Existing Entity: This option allows you to select existing polylines. ➡ Pick Points: This option allows you to select any two points.
Locate the Full Entity		This option, when toggled on, processes the full length of the polyline.
Corner Angle Tolerance		This is the value in degrees that is used in considering whether an arc and/or line is straight in respect to the previous segment. The value is used as a tolerance (plus or minus) from 180 degrees.
Overspray Angle		The Overspray Angle refers to when the program should move to the next spray angle. For example, if you have a corner that is set at 94 degrees, you need to let the program know if you should use a 90-degree spray head in that corner, or jump to a 105-degree spray head. If the overspray angle is set to 5, you would still use a 90-degree head up to 95 degrees.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.
Head Configuration		This icon allows you to change the sprinkler head configuration.
Match Nozzle Properties		This option allows you to configure your current selection from an existing sprinkler head that has been placed into the design. This is a tremendous time saver when compared to having to reselect all associated information through the Edit Head Database/Head Configuration command.

QuickSteps

1. **Select Heads → Locate on Edge.**
The Locate on Edge dialog box (Figure 2-15 on page 17) displays.
2. **Verify the settings in the Locate on Edge dialog box and click on Apply.**
 - A. **Pick Points:** If you want to use the Pick Points option for placement, you are prompted for an insertion point and then the end of a row.

- B. **Follow Existing Entity:** If you want to use the Follow Existing Entity Option for placement, be sure you have a polyline/linestring in your CAD graphic and toggle on that option. You are prompted to select a polyline. Select the polyline/linestring.

You are prompted to pick the side for coverage for either option chosen.

3. **Choose the side for coverage in the CAD graphic.**

The sprinklers are placed.

Example

Below is an example showing how the Locate on Edge command functions.

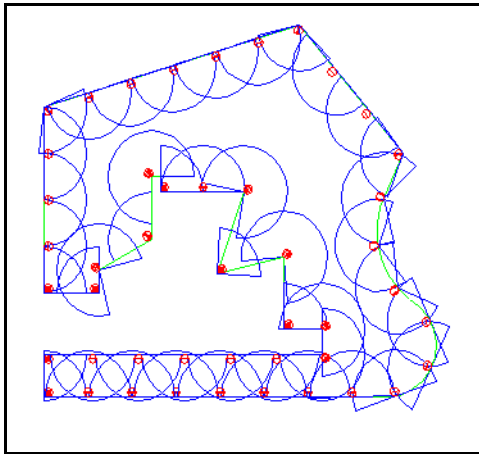


Figure 2-16 *Locate on Edge Example*


Locate Single

IRRIGATION DESIGN ➤ HEADS ➤ LOCATE SINGLE

KEY-IN COMMAND: `irhead`

The Locate Single command allows you to place sprinklers individually. Many designers prefer this method of placing sprinklers as it gives them ultimate control over where the sprinklers are to be located. As such, the ability to quickly insert heads into your design is a key feature of this product. Often it is useful to use the layout template in conjunction with this command.

This command provides a fast and easy way to quickly locate sprinklers in your design. Simply pick the desired coverage from the Locate Single dialog box, show an insertion point and, if you are inserting a part circle head, a rotation angle. Continue placing additional heads of the same coverage arc and then press Enter to terminate the command. Both the sprinkler symbol and the coverage arc are placed in your CAD graphic based on the CAD Settings and Text Properties you specified.

 *The program assumes you are using the currently selected data file and symbol style as set up in the Head Configuration command. For more information, see Head Configuration on page 9.*

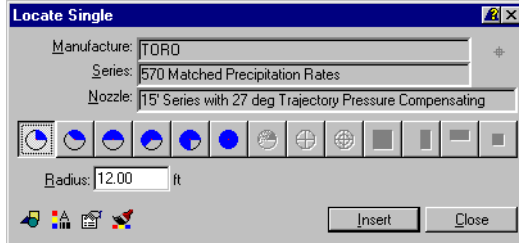







Figure 2-17 Locate Single Dialog Box

Locate Single Dialog Box Definitions

Option	Icon	Function
Manufacture		This is the brand name of the irrigation head.
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Series		This is the model number of the irrigation head.
Nozzle		This is the type of nozzle.
Pattern		This shows the available head coverage.

Locate Single Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Radius		This displays the distance of water spray from the sprinkler head.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the drawing.
Head Configuration		This icon allows you to change information for the irrigation head.
Match Nozzle Properties		This option allows you to configure your current selection from an existing sprinkler head that has been placed into the design. This is a tremendous time saver when compared to having to reselect all associated information through the Edit Head Database/Head Configuration command.
Insert		Click on this button to place a head into the CAD graphic.

QuickSteps

1. Select Heads → Locate Single.

The Locate Single dialog box (Figure 2-17 on page 20) displays.

2. Select the appropriate settings and click on Insert.

3. In the CAD program, locate the sprinkler by picking a point in CAD, then show the rotation angle if using a part circle head by picking another point in CAD.

4. Continue locating sprinklers for any additional heads of the same coverage arc or go back and choose a different coverage arc.

Example

Below is an example showing how you may want to label an individual sprinkler head using the Locate Single command.

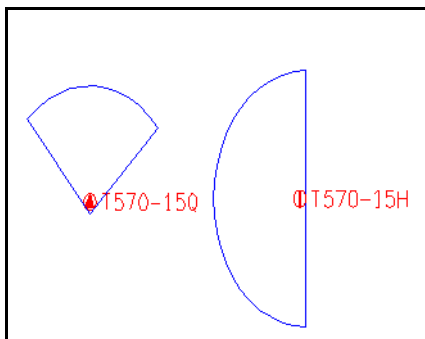


Figure 2-18 Locate Single Example

Show Coverage

IRRIGATION DESIGN ➡ HEADS ➡ SHOW COVERAGE

KEY-IN COMMAND: `ircoverage`

The Show Coverage command is a toggle that turns the coverage arcs on or off. During the design process, you typically want the coverage arcs turned on so that you can see where the coverage is and design accordingly. However, once the sprinkler heads are laid out, the coverage arcs clutter up a design and no longer serve a purpose. Most final irrigation designs do not show the coverage arcs – they are a design tool only. Thus, by toggling the coverage arcs off with this command, you can utilize the design CAD graphic as the final plan.

Example

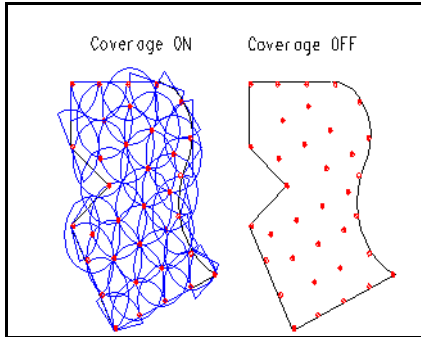


Figure 2-19 Coverage On and Off Example

Edit Heads

IRRIGATION DESIGN ➤ HEADS ➤ EDIT HEADS

The Edit Heads submenu (below) gives you editing abilities that are custom to the **Irrigation Design** product. This submenu gives you the ability to modify the head data without having to remove and insert a new head. The ability to copy and move heads is also provided to increase the speed of plan revisions. The ability to erase the head and remove the associated arc automatically is also available on the Edit Heads submenu.

KEY-IN COMMAND: `iredithead`

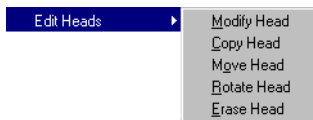


Figure 2-20 Edit Heads Submenu

Modify Head

IRRIGATION DESIGN ➤ HEADS ➤ EDIT HEADS ➤ MODIFY HEAD

KEY-IN COMMAND: `irmodifyhead`

This command allows you to modify the information for a head selected in the CAD graphic.

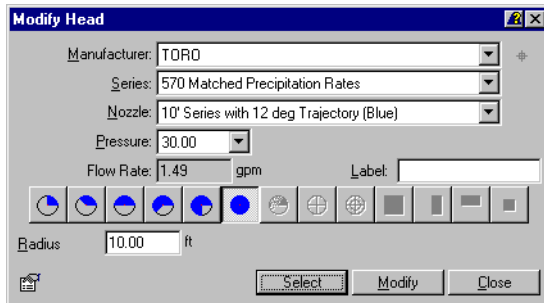



Figure 2-21 Modify Head Dialog Box

Modify Head Dialog Box Definitions

Option	Icon	Function
Manufacturer		This is the brand name of the irrigation head.
Series		This is the model number of the irrigation head.
Nozzle		This is the type of nozzle.
Pressure		This is the operation pressure at the irrigation head.
Flow Rate		This is the rate in GPM (gallons per minute) for the head that will be modified.
Label		This edit field allows you to place text or number designations next to each head as it is placed.
Pattern		This shows the available head coverage.
Radius		This is the radius for the coverage arc to be modified.
Head Configuration		This icon allows you to change information for the irrigation head.
Select		Click on this button to pick the sprinkler head to modify.
Modify		This button allows you to update the CAD graphic with the information you have entered in the Modify Head dialog box (above).

QuickSteps

1. Select Heads → Edit Heads → Modify Head.
2. Click on the Select button and select the head to modify.
3. Modify the necessary items.
4. Click on Modify.
5. Click on Close when finished.

Copy Head

KEY-IN COMMAND: `ircopyhead`

This command allows you to copy a selected head to different locations in the CAD graphic. All information associated with the selected head is also copied.

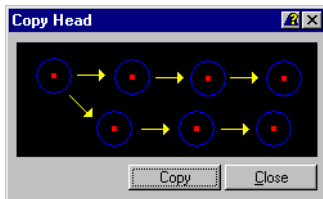


Figure 2-22 Copy Head Dialog Box

Move Head

KEY-IN COMMAND: `irmovehead`

This command allows you to move a selected head from one location to another in the CAD graphic.

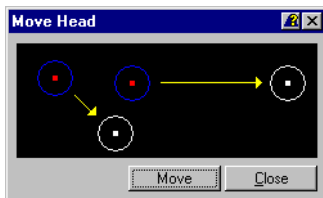


Figure 2-23 Move Head Dialog Box

Rotate Head

KEY-IN COMMAND: `irrotatehead`

This command allows you to rotate the coverage of a selected head.

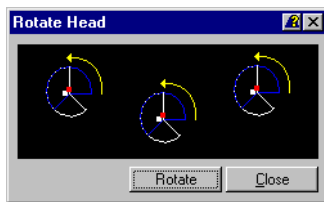


Figure 2-24 Rotate Head Dialog Box

Erase Head

IRRIGATION DESIGN ➤ HEADS ➤ EDIT HEADS ➤ ERASE HEAD

KEY-IN COMMAND: `irerasehead`

This command allows you to erase heads from the CAD graphic.

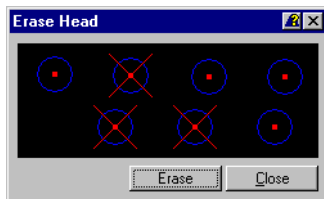


Figure 2-25 Erase Head Dialog Box

Analyze Distribution

IRRIGATION DESIGN ➤ HEADS ➤ ANALYZE DISTRIBUTION

KEY-IN COMMAND: `iranalysis`



Figure 2-26 Analyze Distribution Submenu

Distribution Analysis

IRRIGATION DESIGN ➤ HEADS ➤ ANALYZE DISTRIBUTION ➤ PERFORM ANALYSIS

The Analyze Distribution command is used to provide a graphical representation of how much water is being used to cover a given area.

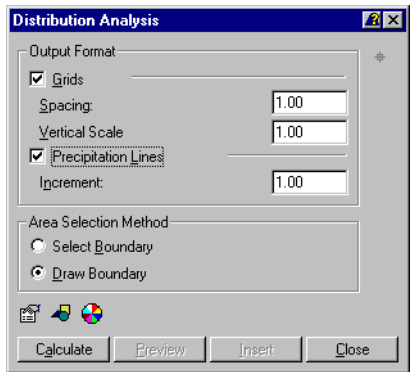




Figure 2-27 Distribution Analysis Dialog Box

Distribution Analysis Dialog Box Definitions

Option	icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Grids		Toggle this option on or off to display the grid or hide it.
Spacing		This edit field provides selections from 1' to 20'. Units and labels vary, depending on the settings. Change values using the edit field or by picking in CAD.
Vertical Scale		This value is multiplied to the Z-coordinates of the surface model. The rectangular grid is then placed at the exaggerated elevations. This allows the vertical relief of the grid for relatively flat sites to be exaggerated.
Precipitation Lines		This toggles on the contours representing the precipitation rate.
Increment		This edit field provides selections from 0.1" to 2". Units and labels vary depending on the settings.
Select Boundary		This option allows you to select the defining polyline/linestring to be used as a boundary.
Draw Boundary		This option allows you to draw the defining polyline/linestring to be used as a boundary.
Distribution Settings		This icon allows you to customize the coverage pattern of the nozzle.

Distribution Analysis Dialog Box Definitions

<i>Option</i>	<i>icon</i>	<i>Function</i>
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Color Settings		This icon allows you to assign a specific color to a specific precipitation rate.
Calculate		This button begins the command to perform the analysis.
Preview		Click on this button to review the analysis before placing it into the CAD graphic.

QuickSteps

1. **Select Heads → Analyze Distribution → Perform Analysis.**
2. **Choose the type of output desired: Grids, Precipitation Lines, or both.**
3. **Set the parameters for the selected entities (i.e., contour interval or grid interval).**
4. **Click on the Calculate button.**
 - A. **If Select Boundary was selected, you are prompted:**

Select a closed polyline.

Select the closed polyline.
 - B. **If Draw Boundary was selected, you are prompted:**

Select corner points for the area.

Draw a boundary around the area you want to perform an analysis on and press Enter when done.
5. **Click on the Preview button to view the results before placing them in the CAD graphic.**
6. **Click on the Insert button to place the results into the CAD graphic.**

Examples

The example below shows a 3-D grid of where the greatest and least amounts of water are being placed based on the location of the sprinklers and the discharge pattern that the sprinklers produce.

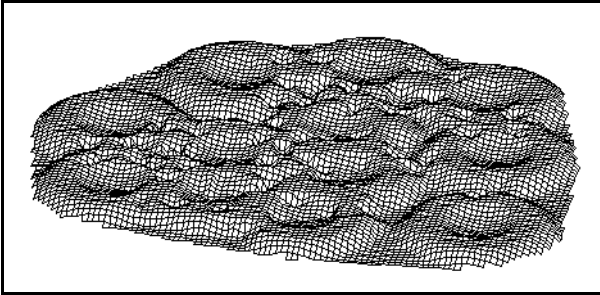


Figure 2-28 Greatest and Least Amounts of Water Example

The example below shows precipitation rates lines (essentially contour lines of equal precipitation rates).

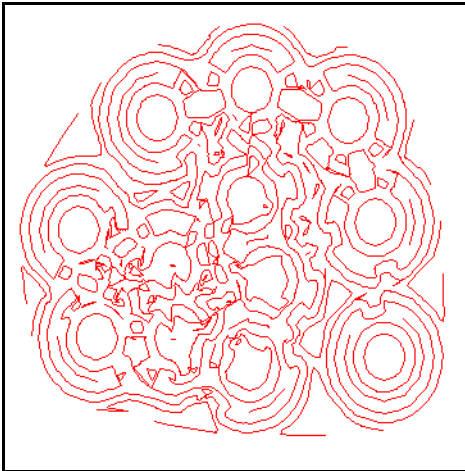


Figure 2-29 Precipitation Rates Lines Example

Distribution Query

IRRIGATION DESIGN ➤ HEADS ➤ ANALYZE DISTRIBUTION ➤ DYNAMIC QUERY

KEY-IN COMMAND: `irquery`

This command is used to provide a dynamic query of the precipitation rate at any given spot just by moving the cursor over an area.

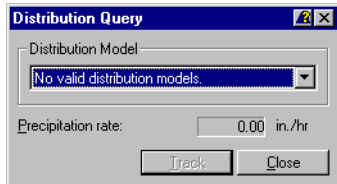


Figure 2-30 Distribution Query Dialog Box

Distribution Query Dialog Box Definitions

Option	Function
Distribution Model	Select from a defined surface or distribution surface created with the Form Distribution command.
Precipitation rate	This value is the rate at which the sprinkler heads apply water to a specific area of coverage over a period of time (measured in inches per hour).
Track	When this is clicked on, as the cursor passes over the specific area, the precipitation rate is updated dynamically.

QuickSteps

1. Select **Heads → Analyze Distribution → Dynamic Query**.
2. Click on **Track**.
3. Move your cursor in the CAD graphic to view the results.


This displays the precipitation rate for the area where the cursor is located.

Adjust to Surface

IRRIGATION DESIGN ➤ HEADS ➤ ADJUST ELEVATION

KEY-IN COMMAND: `iradjustelev`

The Adjust Elevation command is used to move a sprinkler up or down in three-dimensional space to bring it to the correct elevation on the terrain surface.

 *At least one surface model must have been previously created for the current project. As such, this command requires **Surface Modeling**.*

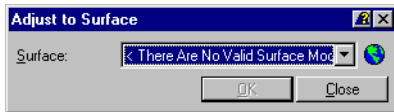



Figure 2-31 Adjust to Surface Dialog Box

Adjust to Surface Dialog Box Definitions

Option	Icon	Function
Surface		Select a name from the list of previously created surface models for this project, or click on the All Surface Models icon to select a surface model from a different project.

QuickSteps

- Select Heads → Adjust Elevation.**
The Adjust to Surface dialog box (above) displays.
- From the drop list, select a defined surface.**
- Click on OK to move the sprinklers to the correct elevation.**

Example

This example shows a surface model after adjusting the elevation of the sprinklers to the terrain.

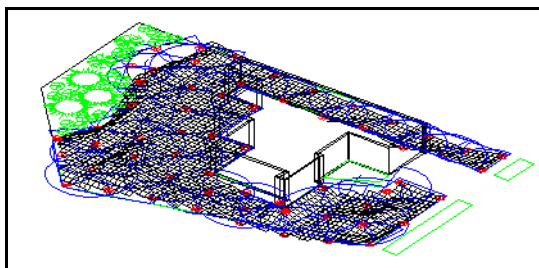


Figure 2-32 Surface Model Example After Adjusting Elevation

Head Database Editor

IRRIGATION DESIGN ⇨ HEADS ⇨ EDIT HEAD DATABASE

KEY-IN COMMAND: `irheaddata`

The Edit Head Database command is used to edit the data that is used when locating sprinkler heads. Information is generally taken directly from the manufacturer's catalogs and contains operating pressures, coverage radius (or length and width), and discharge flow for each nozzle. Once this information is in the program, you do not need to be concerned with it. However, new lines of sprinklers or updates to existing lines are happening all the time, which may make it necessary for you to update the information. This command provides a means for doing that.

When a manufacturer is selected from the drop list, the available sprinklers change for that manufacturer. Likewise, when a sprinkler is selected from the drop list, the available nozzles for that sprinkler body changes. The information displayed about each sprinkler, including operating pressures, radius (or length x width), available arcs, etc., all change based on which nozzle is selected.

If a specialty pattern nozzle is chosen, then radius becomes length and width. All values stored in the table are flow in gallons per minute (GPM), or in liters per minute (LPM) in a metric drawing.

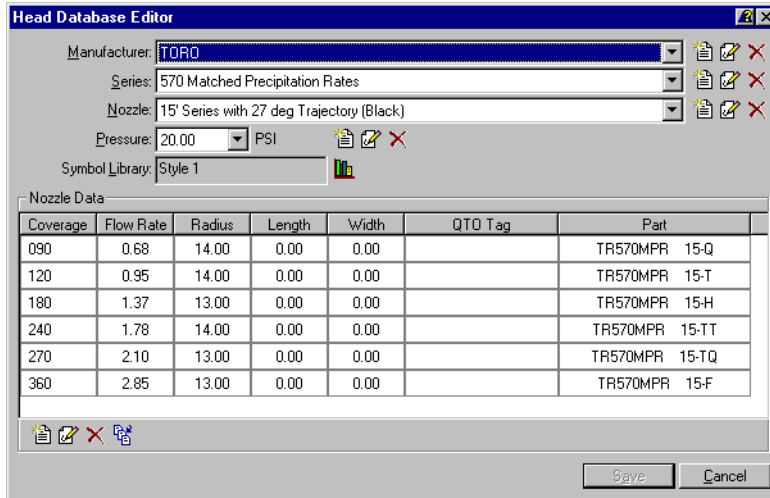


Figure 2-33 Head Database Editor Dialog Box

Head Database Editor Dialog Box Definitions

Option	Icon	Function
Manufacturer		From this drop list, select the manufacturer and irrigation head styles and nozzles from the database.
Series		This drop list displays the model number of the irrigation head.
Nozzle		This option specifies the type of nozzle to use.
Pressure		Select the operating pressure from this drop list.
Symbol Library Manager		Select the type of symbol to associate with this irrigation head by clicking on the Symbol Library Manager icon.
Nozzle Data		This displays the data found in the database for a particular model, head, and nozzle.
Add New Coverage		Clicking on this icon allows you to add a new coverage to the nozzle data.
Modify Coverage		Clicking on this icon allows you to modify the selected coverage.
Delete Coverage		Clicking on this icon allows you to delete the selected coverage.
Apply Global Values		Clicking on this icon allows you to assign global values, such as quantity takeoff tags, flow rates, and part numbers to all coverages for a selected nozzle, manufacturer, series, or pressure.

Head Symbols Library

When you click on the Symbols Library Manager icon in the Head Database Editor dialog box (Figure 2-33 on page 33), the Head Symbols Library dialog box displays.

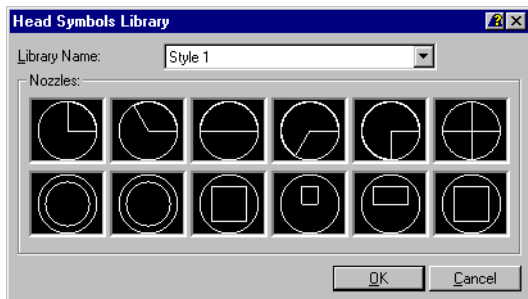


Figure 2-34 Head Symbols Library Dialog Box

Head Symbols Library Dialog Box Definitions

Option	Function
Library Name	This drop list displays the type of symbol to be inserted.
Nozzle	This area displays the nozzle symbols available in the selected style.

QuickSteps

1. Select Heads → Edit Head Database.

The Head Database Editor dialog box (Figure 2-33 on page 33) displays.

2. From the list, select the manufacturer of the sprinkler you wish to edit. If the manufacturer you want is not on the list, you may automatically create a new manufacturer by clicking on the New Manufacturer icon and typing a name.

3. From the list, choose one of the available sprinklers.

4. From the list, choose one of the available nozzles. If the available nozzle is not on the list, you may specify a new nozzle by clicking on the Add Nozzle icon.

This creates a new record in the database for that nozzle.

5. Edit any of the values in the available cells. If this is a new record, you may select the Pressure field or the Radius/Arc field.

This creates a new row in the table.

6. When you are done making changes, click on Save to write this information permanently to the database.

If you make changes and attempt to exit without saving, you are prompted to save your work.

7. **Select the next sprinkler you wish to edit or click on Close to exit.**

Example

The following example shows how you might edit the head database.

1. **Select Heads → Edit Head Database.**
2. **Pick Toro from the Manufacturer drop list in the Head Database Editor dialog box (Figure 2-33 on page 33).**
3. **Select 570 Pressure Compensation from the Series drop list.**
4. **Select 15' foot 27 degree Trajectory from the Nozzle drop list.**
5. **Click on Add New Coverage icon.**
6. **In the new column that displays, type 315 for coverage.**
7. **Fill in the values from the Toro catalog for a 315° coverage arc at each of the available pressures.**
8. **Click on Save when done.**
9. **Click on Close to dismiss the Head Database Editor dialog box.**

ZONES

The Zones menu contains all of the tools related to identifying or querying groups of sprinklers that are run from the same valve.

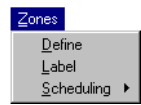
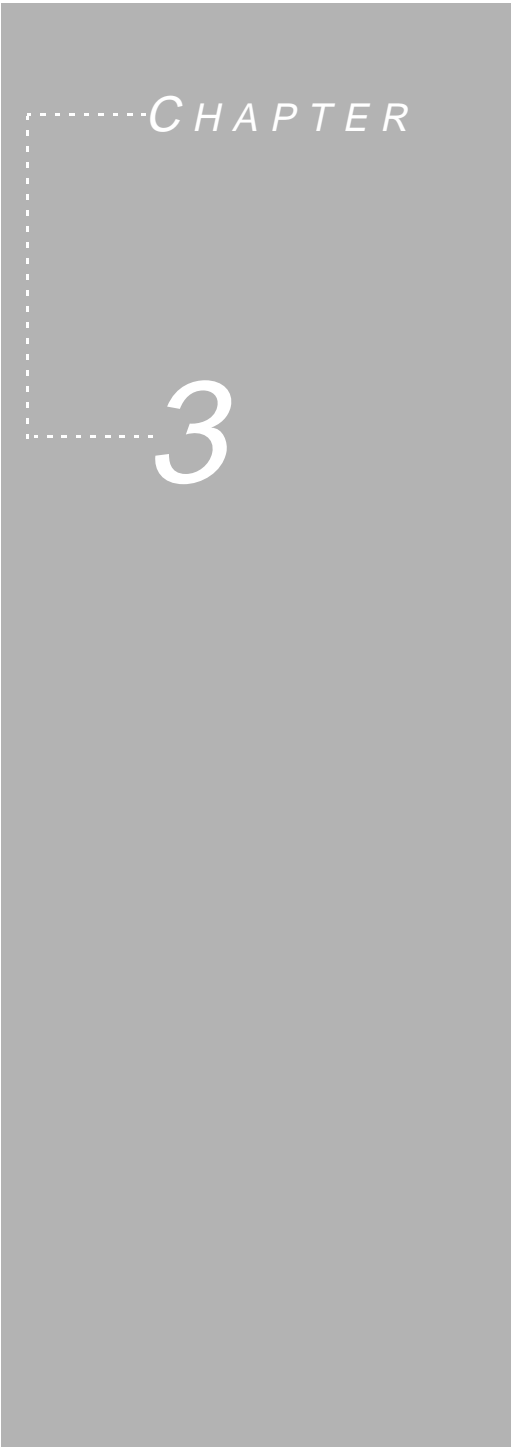


Figure 3-1 Zones Menu

In this chapter:

<i>Define Zone</i>	38
<i>Label Zone</i>	40
<i>Scheduling</i>	42



Define Zone

IRRIGATION DESIGN ➤ ZONES ➤ DEFINE

KEY-IN COMMAND: `irzonedefine`

This command is located in the Zones menu. It can also be accessed whenever a zone selection is made and no zone is currently defined.


The purpose of this command is to group all heads into a zone. Typically, only a certain amount of water is available at any one time on a site. The actual amount of water available can be determined by one of the following methods:

- Call the local planning department and ask for the water flow and pressure at a given address.
- Use a special flow meter attached to a water source to measure flow rate.
- Use a five-gallon bucket and a stopwatch and measure how much water you can obtain from a spigot in one minute.

For a residence, this might be 15 gallons per minute. For a commercial application or an apartment complex, this might be 60 or 70 gallons per minute. For a golf course that has its own pond and high-powered pump, this might be several hundred gallons per minute. In each case, however, there is a limited amount of water that is available at one time. Therefore, it is necessary to group sprinklers that are controlled by the same valve in order to have enough water. Typically, a zone uses about 90% of the available water, so that zone must be shut down before the next zone is turned on. This process is handled by scheduling which zones are to operate at which times, and then programming the controller or clock to operate those zones at the times requested.

Assume you have 15 GPM available. Also assume you have sprinklers that are discharging 4 GPM for a 360° head, 3 GPM for a 270° head, 2 GPM for a 180° head, and 1 GPM for a 90° head. It is easy to total up the discharge put out by these heads. For argument's sake, assume you have a rectangle with a 90° head in each corner, one half circle head along the short side, two half circle heads along the length, and one full circle head in the center of this area. If you add up the combined discharge of all these heads, you would have 20 GPMs. You only have 15 GPMs available. Therefore, you would need a minimum of two zones in order to water this entire area. The second zone would be turned on after the first zone had been turned off.

Once you group the heads into a zone, by outlining a zone with a closed polyline/linestring (the polyline/linestring is drawn on a separate layer/level that can be turned off), you can visually see which heads belong to which zone.

-  It is easier to zone your entire job site at once rather than having to select heads again later during the piping process.

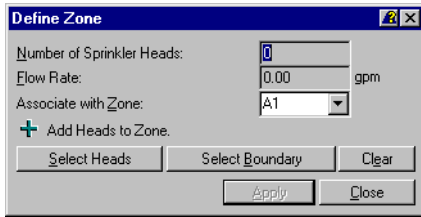
The image shows a software dialog box titled "Define Zone". It contains three input fields: "Number of Sprinkler Heads" with a value of 0, "Flow Rate" with a value of 0.00 and the unit "gpm", and "Associate with Zone" with a dropdown menu showing "A1". Below these fields is a button labeled "+ Add Heads to Zone.". At the bottom of the dialog are four buttons: "Select Heads", "Select Boundary", "Clear", and "Apply". A "Close" button is also present at the bottom right.

Figure 3-2 Define Zone Dialog Box

Define Zone Dialog Box Definitions

<i>Option</i>	<i>Function</i>
Number of Sprinkler Heads	This edit field shows the quantity of the irrigation heads that you have selected for this zone.
Flow Rate	This value shows the calculated flow rate from the heads you have selected.
Associate with Zone	This drop list shows the name of the zone.
Add Heads to Zone	This option allows you to add more heads to achieve a running total of heads and gpm.
Select Heads	Click on this button to select heads.
Select Boundary	Click this button to choose a boundary which surrounds the heads.

QuickSteps

1. Select Zones → Define.

The Define Zone dialog box (above) displays.

2. Click on Select Heads or Select Boundary to identify which heads you wish to group together.

The total number of sprinklers selected and the combined discharge are displayed in the dialog box.

3. Enter a Zone ID in the Associate with Zone edit field.

4. Click on Apply to save this information as a zone.

Example

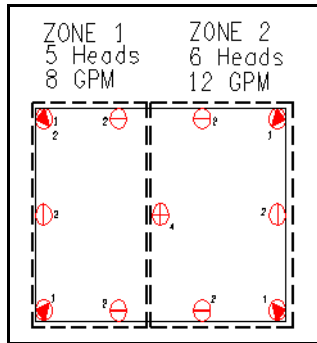



Figure 3-3 Flow Rate Query Example

Label Zone

IRRIGATION DESIGN ➤ ZONES ➤ LABEL

KEY-IN COMMAND: `irzonelabel`

The purpose of this command is to insert a label tag that identifies a zone and indicates the total discharge required for that zone. This is an enhanced label that would show what valve is being used, and all associated heads to that flow/zone could be more easily queried.

 *You must already have sized the pipe and located a valve in your design before you can attach a zone label.*

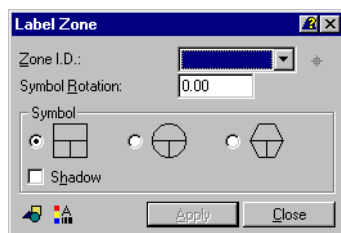





Figure 3-4 Label Zone Dialog Box

Label Zone Dialog Box Definitions

Option	Icon	Function
Zone ID		The label for the zone displays in this drop list.
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Symbol Rotation		This allows you to specify the angle of the zone label.
Symbol		Turn on the radio button of the style of label you want to use.
Shadow		This toggle changes the appearance of the symbol styles by adding shadows.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

- Select Zones → Label.**
The Label Zone dialog box (Figure 3-4 on page 40) displays.
- Select the Zone you want to label.**
- Choose the symbol desired.**
- Enter a rotation angle.**
- Click on Apply.**
You are prompted to locate the label.
- Locate the label by clicking on the desired location in the CAD graphic.**

Example

Below is an example of what the label tags look like. Notice that the zone ID, the size of the valve that operates the zone, and the total flow through that zone are included.

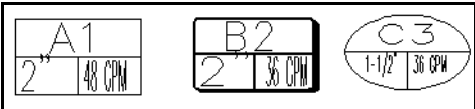


Figure 3-5 Label Tags Example


Scheduling

IRRIGATION DESIGN ⇨ ZONES ⇨ SCHEDULING



Figure 3-6 Scheduling Submenu

The purpose of the Scheduling command is to calculate the precipitation rate and operating times, as well as to generate a report based on these calculations. You would then be able to take this information to program your controller.

 *You must have already sized the pipe and located at least one valve in your design before you can run the Scheduling command.*

Calculations

IRRIGATION DESIGN ⇨ ZONES ⇨ SCHEDULING ⇨ CALCULATIONS

KEY-IN COMMAND: `irzonecalc`

The purpose of the Calculations command is to calculate precipitation rate and operating time in minutes per day, based on a variable number of days per week that you can apply water. Using this information, you can produce a schedule which can be used to program your controller.

Precipitation rate is calculated using the following formulas.

For square spacing:

$$\frac{GPM(\text{one } 360^\circ \text{ Head}) \times 96.25}{\text{head spacing in feet} \times \text{row spacing in feet}} = \text{inches/hour of precipitation}$$

3.1

For triangular spacing:

$$\frac{GPM(one\ 360^\circ Head) \times 96.25}{(Head\ Spacing)^2 \times 0.866} = (inches)/(hour\ of\ precipitation)$$

3.2

Operating time is calculated as:

$$\frac{Total\ weekly\ reqd(in/week) \times 60(min/hr)}{precip\ rate(in/hr)} = Station\ run\ time(min/week)$$

3.3

Schedule

Figure 3-7 Schedule Dialog Box

Schedule Dialog Box Definitions

Option	Function
Zone ID	This is the ID of the zone to calculate the routine and precipitation.
Watering requirement	This is the amount of water required per week in inches.
Days of the Week	If you select this option, select on which days of the week to irrigate.
Every X Days	Select this option to select every third or second day to irrigate, or any other regular interval.
Results	<p>➡ Precipitation rate: These are the inches per hour for a certain zone.</p> <p>➡ Operating time: This is the time required to deliver water at required amounts and days per week (time in minutes).</p>

QuickSteps

1. Select Zones → Scheduling → Calculations.

The Schedule dialog box (above) displays.

2. Select the zone to water.

3. Enter the watering requirements for the week.

4. Select the days on which to water.

Results are calculated and shown in the dialog box.


5. Click on Apply to attach this information to a zone.

Schedule Report

IRRIGATION DESIGN ➤ ZONES ➤ SCHEDULING ➤ REPORTS

KEY-IN COMMAND: `irzonereport`

The purpose of the Reports command is to produce a report based on the calculations in the Calculations command. Using this information, you can produce a schedule which can be used to program your controller.

 You must already have sized the pipe and located at least one valve in your design before you can run the Reports command.

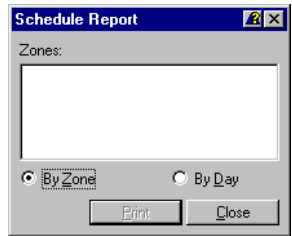


Figure 3-8 Schedule Report Dialog Box

Schedule Report Dialog Box Definitions

Option	Function
Zones	This is a list of the current zones that are defined in the CAD graphic.
By Zone	Choose this option to generate a report for the selected zone.
By Day	Choose this option to generate a report based on the number of days available.

QuickSteps

1. **Select Zones → Scheduling → Report.**
The Schedule Report dialog box (above) displays.
2. **Select a defined zone from the list box.**
3. **Specify whether you wish to prepare the report by day or by zone.**

Example

Output Example

Day 1

Zone ID	Zone GPM x Duration (Min)		Gallons
A1	49	23	1127
A2	24	39	936
A3	74	33	2442
Totals for Day 1	=	95	4504

Day 2

Zone ID	Zone GPM x Duration (Min)		Gallons
A1	49	23	1127
A2	24	39	936
A3	74	33	2442
Totals for Day 2	=	95	4505

Day 3

Zone ID	Zone GPM x Duration (Min)		Gallons
A1	49	23	1127
A2	24	39	936
A3	74	33	2442
Totals for Day 3	=	95	4505
Weekly totals	=	285	13515

PIPE

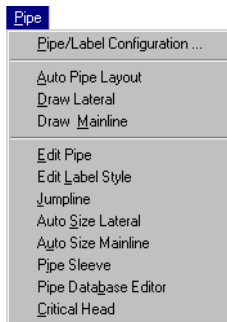
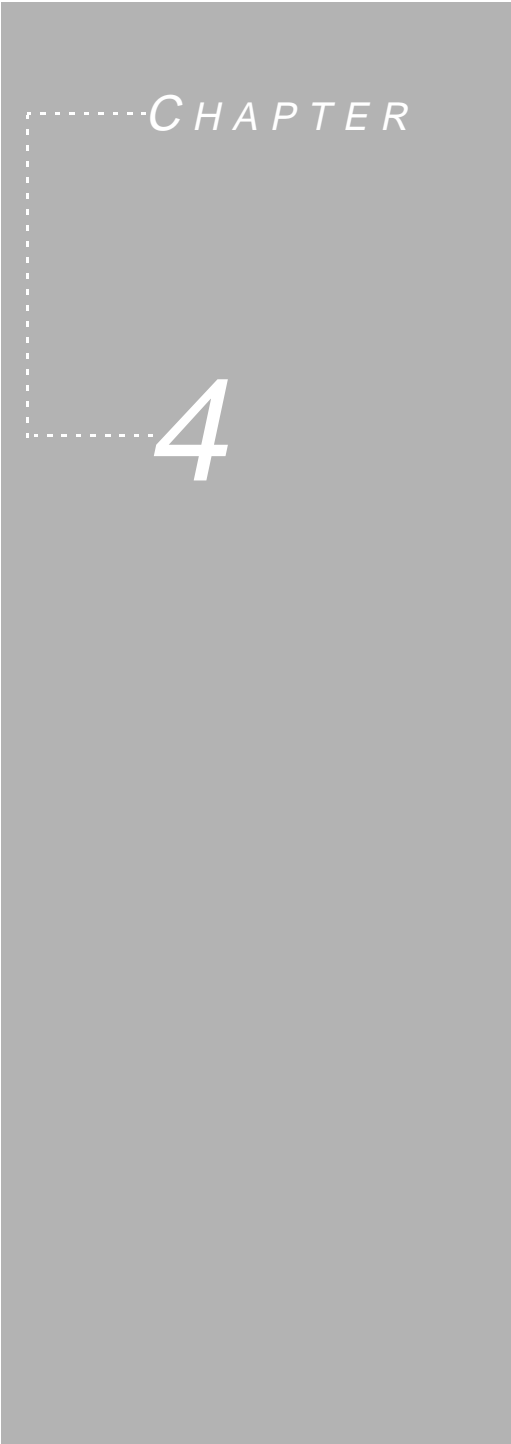


Figure 4-1 Pipe Menu

In this chapter:

<i>Pipe and Label Configuration</i>	48
<i>Auto Layout</i>	51
<i>Draw Lateral</i>	53
<i>Draw Mainline</i>	55
<i>Edit Existing</i>	57
<i>Change Label Style</i>	59
<i>Insert Pipe Jump Line</i>	61
<i>AutoSize – Laterals</i>	63
<i>AutoSize Mainline Wizard</i>	65
<i>Pipe Sleeve</i>	69
<i>Edit Pipe Database</i>	70
<i>Critical Head</i>	73



Pipe and Label Configuration

IRRIGATION DESIGN ➤ PIPE ➤ PIPE LABEL/CONFIGURATION

KEY-IN COMMAND: `irpipeconfig`

The Pipe and Label Configuration dialog box is used to set parameters for pipe insertion and contains the following:

- Pipe data file selection
- **QTO** link option
- Object property overrides
- Label style

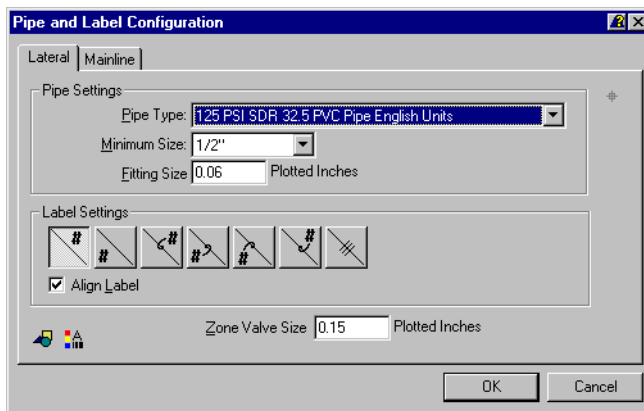




Figure 4-2 Pipe and Label Configuration Dialog Box – Lateral Tab

Pipe and Label Configuration Dialog Box – Lateral Tab Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Pipe Type		This drop list shows the type of pipe for lateral piping.
Minimum Size		This drop list shows the minimum size for auto pipe sizing of lateral pipes.
Fitting Size		This value is the size of the irrigation fitting symbol.
Label Settings		Define the location of the pipe label in relation to the pipe by clicking on the icon illustrating the desired location.
Align Label		Toggle this option on to position the label based on the position of the pipe.
Zone Valve Size		This value is the size of the zone valve label.

Pipe and Label Configuration Dialog Box – Lateral Tab Definitions

Option	Icon	Function
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

Pipe and Label Configuration – Mainline Tab

IRRIGATION DESIGN ⇨ PIPE ⇨ PIPE/LABEL CONFIGURATION ⇨ MAINLINE TAB

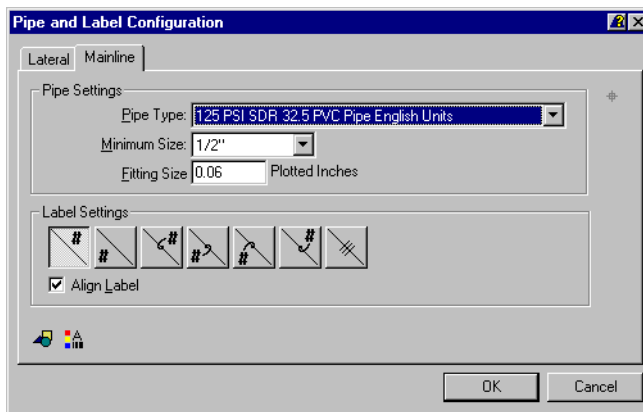





Figure 4-3 Pipe and Label Configuration Dialog Box – Mainline Tab

Pipe and Label Configuration Dialog Box – Mainline Tab Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Pipe Type		This drop list shows is the type of pipe used for mainline piping.
Minimum Size		This drop list shows the minimum size used for auto pipe sizing of mainline pipes.
Fitting Size		This option is the size of the irrigation fitting symbol.
Label Settings		Define the location of the pipe label in relation to the pipe by clicking on the icon illustrating the desired location.
Align Label		Toggle this option on to position the label based on the position of the pipe.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.

Pipe and Label Configuration Dialog Box – Mainline Tab Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

1. Select Pipe → Pipe/Label Configuration.

The Pipe and Label Configuration dialog box – Lateral Tab dialog box (Figure 4-2 on page 48) displays.

2. Choose the pipe type from the drop list. If you are setting up both laterals and mainlines, choose a pipe type for each under the appropriate tab.

3. Indicate a minimum pipe size to use.

4. Select the label style from the Label Settings group.

5. Click on the Text Properties icon.

6. Specify a text height or size for each pipe label.

7. Select a text style for the label and click on OK.

8. Click on the CAD Settings icon to change any color and layer/level information in the CAD Settings dialog box.

9. Click on OK when you are finished making your changes.

The Pipe and Label Configuration dialog box displays again.

10. Click on OK to close the Pipe and Label Configuration dialog box.

Auto Layout

KEY-IN COMMAND: `irautopipe`

The Auto Pipe Layout command provides you with a means to have the computer make a preliminary decision as to how the pipes in a specified zone should be routed. This command does not take into consideration obstacles or individual preferences; therefore, it should be viewed as a preliminary suggestion only. Once the computer has laid in the rough pipe layout, you should edit the locations to ensure an adequate design.





 *If you want to create a U-shaped layout or have pipes at odd angles, you should lay out those pipes manually.*



Figure 4-4 Auto Layout Dialog Box

Auto Layout Dialog Box Definitions

Option	Icon	Function
Zone ID		Select a zone number from a list of defined zones in the drop list. If no zones are defined, you have the opportunity to select a closed polyline/linestring and define a zone on the fly. By selecting a zone, you already know which sprinklers are included.
Define		Click on this button to define a new zone.
Place Label		This option places a pipe label at the specified location on the pipe.
Pipe/Label Configuration		This option provides direct access to the Pipe and Label Configuration dialog box (Figure 4-2 on page 48).
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

1. **Select Pipe → Auto Pipe Layout.**

The Auto Layout dialog box (Figure 4-4 on page 51) displays.

2. **Pick a Zone ID from the drop list or put focus in the drop list and click on Define to define a zone.**

3. **Click on Apply.**

4. **Click in the CAD graphic to specify the valve location.**

5. **Click in the CAD graphic to specify the end point of the primary lateral.**

The pipes are laid out.

Example

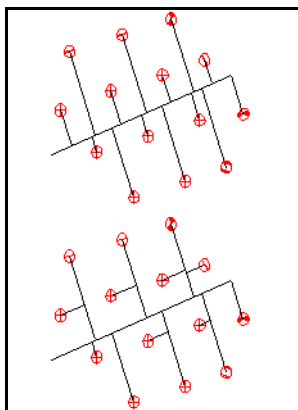



Figure 4-5 Automatic Pipe Layout Example

Draw Lateral

KEY-IN COMMAND: `irlateral`

The purpose of the Draw Lateral command is to allow you to manually lay out the lateral pipes within a zone. Often, due to variations in terrain, obstacles (both natural and man-made), or simply the desires of the designer, it is desirable to lay out the location of the pipes manually rather than having the computer perform this task. When laying out pipe, you need to indicate which sprinkler heads the pipes tie into, where they connect to other pipes, and where they tie into the mainline (where the valve is located).

 *If you do not know the size of the lateral as you lay out your design, simply select a size, then use the Auto Size Laterals command later.*

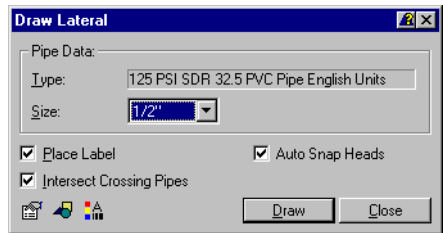





Figure 4-6 Draw Lateral Dialog Box

Draw Lateral Dialog Box Definitions

Option	Icon	Function
Type		This is the type of pipe to be used for lateral piping.
Size		From this drop list, select the size of the pipe that you are drafting.
Place Label		Turn this toggle on to display the label.
Intersect Crossing Pipes		This option allows you to cross lateral pipes without "connecting" to crossing pipes in that zone. If this option is toggled on, pipes break at intersections.
Auto Snap Heads		This option, when toggled on, allows the pipe to automatically attach to the sprinkler head if the point that you selected is close to the head symbol. The distance that enacts the snap is roughly twice the size of the head symbol.
Pipe/Label Configuration		This option provides direct access to the Pipe and Label Configuration dialog box (Figure 4-2 on page 48).
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.

Draw Lateral Dialog Box Definitions

Option	Icon	Function
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.
Draw		This button takes you to the CAD graphic to draw the pipes. The lines that are drawn are automatically trimmed to the edge of the symbols or to another pipe.

QuickSteps

1. Select Pipe → Draw Lateral.

The Draw Lateral dialog box (Figure 4-6 on page 53) displays.

2. Indicate the type of pipe to use.

3. Select the appropriate pipe size.

4. Toggle on or off the Place Label option as desired. If on, verify the label style by clicking on the Pipe/Label Configuration icon, selecting the label desired, and clicking on Apply.

5. Click on Draw.

You are prompted for the starting point and ending point of each line. Since you often want to draw many laterals at one time, this dialog box is visible until you close it.

Examples

As you draw the laterals, notice how the lines snap to the center of the sprinkler symbols, as shown below.

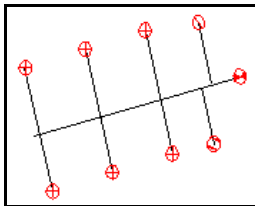


Figure 4-7 Draw Lateral Example

The following example shows how the Draw Lateral command handles input. Notice how pipes are trimmed to the edge of the symbols.

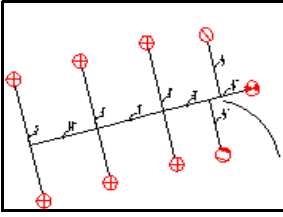



Figure 4-8 Lateral Example

Draw Mainline

IRRIGATION DESIGN ➤ PIPE ➤ DRAW MAINLINE

KEY-IN COMMAND: `irmainline`

The purpose of the Draw Mainline command is to graphically show how the water gets from the sources (such as a water meter near the property line or connection point to the domestic water supply) out to each of the individual zones and their respective valves. Graphically, mainlines are usually shown as a heavier line type than the laterals, and may also be dashed to differentiate their use. Usually the mainline is the same type of pipe material found elsewhere in an irrigation system, but perhaps with thicker walls. Since it has a different function however, it may be shown differently for graphical illustration. The mainline must be at least as large as the largest diameter lateral found on the project.

 *If you are unsure of the size of mainline you need as you lay out your design, simply select a size and then use the Auto Size Mainline command later.*

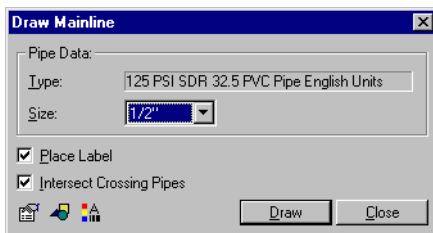





Figure 4-9 Draw Mainline Dialog Box

Draw Mainline Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Type		This option is the type of pipe used for the mainline pipe.
Size		This drop list shows the size of the mainline pipe.
Place Label		Toggle this option on or off to display the label.
Intersect Crossing Pipes		This option allows you to cross mainline pipes without “connecting” to crossing pipes in that zone. If this option is toggled on, pipes break at intersections.
Pipe/Label Configuration		This option provides direct access to the Pipe and Label Configuration dialog box (Figure 4-2 on page 48).
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.
Draw		This button takes you to the CAD graphic to draw the mainlines.

QuickSteps

1. Select Pipe → Draw Mainline.

The Draw Mainline dialog box (Figure 4-9 on page 55) displays.

2. Verify each of the various settings, such as pipe type, size, label style, etc.

3. Click on Draw and begin drawing the mainline.

Even though you may have selected PVC as the pipe type, you continue to be prompted for the next point until you terminate the command by pressing Enter, because mainlines are often shown as a continuous polyline/linestring. You may draw the mainline as a loop that ties back into itself.

Example

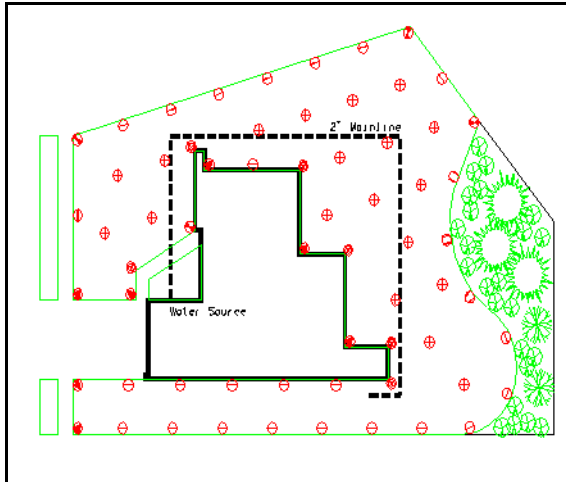


Figure 4-10 Mainline Example

Edit Existing

IRRIGATION DESIGN ➞ PIPE ➞ EDIT PIPE

KEY-IN COMMAND: `ireditpipe`

The purpose of the Edit Pipe command is to change one type of pipe to another type of pipe. In some instances, you may simply want to change from CL160 PVC to CL200 PVC or the same pipe type. In other instances, you may want to change from 1/2" pipe to 3/4" pipe.

This command allows you to edit existing pipes, material, and size. The label, if it exists, is automatically updated.

Figure 4-11 *Edit Existing Dialog Box*

Edit Existing Dialog Box Definitions

Option	Function
Type	This drop list shows the type of pipe selected.
Size	This drop list shows the nominal size of the pipe.
Roughness Coefficient	This value is the factor used in determining friction loss.
Inside Diameter	This value is the actual inside diameter of the pipe.
Flow Volume	This value is the current volume of water traveling through the pipe in GPM.
Flow Velocity	This value is the current velocity of water in the pipe in ft/sec.
Pressure Loss	This value is the current pressure loss due to friction loss.
Pipe Length	This value is the length of the current pipe segment.

QuickSteps

1. **Select Pipe → Edit Pipe.**
The Edit Existing dialog box (above) displays.
2. **Click on the Select button and choose the desired pipe.**
3. **Verify the pipe type and size.**
4. **Click on Apply.**

Change Label Style

KEY-IN COMMAND: `ireditlabel`

The purpose of the Edit Label Style command is to change from one labeling style to another in order to make your plan appear more graphically pleasing. For example, if you have labels that conflict with the pipe locations, you may want to mirror them, rotate them, or select a different style so that the plan becomes more readable. The pipe data does not change – only the labeling style does. To change the pipe data, use the Edit Pipe command.

For more information, see *Edit Existing* on page 57.




 Often when you are automatically sizing pipes, the labels may need to be moved or switched to the other side of the pipe to make them more graphically readable. Changing the pipe label style can accomplish this.



Figure 4-12 Change Label Style Dialog Box

Change Label Style Dialog Box Definitions

Option	Icon	Function
New Style		Select the style you wish to use.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

- Select Pipe → Edit Label Style.**
The Change Label Style dialog box (above) displays.
- Click on the button that has an image of the pipe label style you want as the new label style and click on OK.**

You are prompted:

Select Pipe to edit.

3. **Choose the pipe(s) whose label(s) you wish to modify.**
4. **Click on Close.**

Examples

On selected labels, convert from this style:



to this style:



Here are the results:

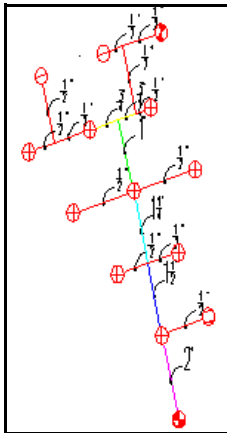


Figure 4-13 Before Using Change Pipe Labels Command Example

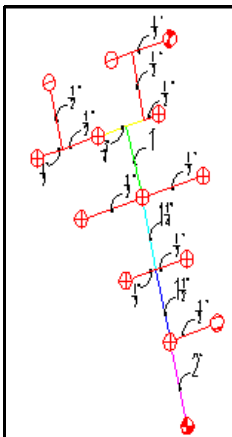


Figure 4-14 After Using Change Pipe Labels Command Example

Insert Pipe Jump Line

IRRIGATION DESIGN ➤ PIPE ➤ JUMP PIPE

KEY-IN COMMAND: `irjumpline`

The purpose of the Jump Pipe command is to place an arc over two lines that appear to intersect, but which are not connected in the real world. This graphically shows that the lines in fact might cross, but they are not related to each other. In irrigation plans, this is often the case with pipes that might pass within a couple of inches of each other.

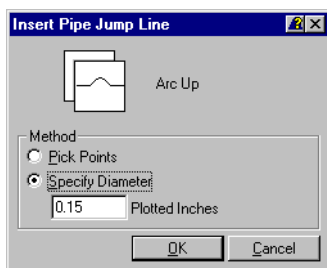


Figure 4-15 Insert Pipe Jump Line Dialog Box

Insert Pipe Jump Line Dialog Box Definition

<i>Option</i>	<i>Function</i>
Arc Up/Arc Down	Use this icon toggle to indicate whether you would like the arc going up or going down. When you click on the icon, it changes from Arc Up to Arc Down and vice versa.
Pick Points	By selecting two points along a pipe, the software will place an arc that fits between points selected.
Specify Diameter	Selecting a diameter will keep the arcs uniform in size. Utilizing this method will enhance the clarity of the designs. The size is based on the plot scales.

QuickSteps

1. Select Pipe → Jump Pipe.

The Insert Pipe Jump Line dialog box (Figure 4-15 on page 61) displays.

2. Select either Arc Up or Arc Down.

3. Choose the method and click on OK.

A. If you chose the Pick Points method, you are prompted:

Select Pipe.

Choose the pipe on which you want to place the jumpline.

You are prompted:

Select first point.

Pick a point on the selected pipe just outside the intersecting line for the start point of the arc.

You are prompted:

Select next point.

Pick a point on the selected pipe just outside the intersecting line for the end point of the arc.

The arc is drawn.

B. If you chose the Specify Diameter method, you are prompted:

Select Pipe.

Select the pipe on which you want to place the jumpline.

You are prompted:

Select insertion point.

Select an insertion point on the selected pipe for the jumpline.

The arc is inserted.

Example

Below is an example of a jumpline.

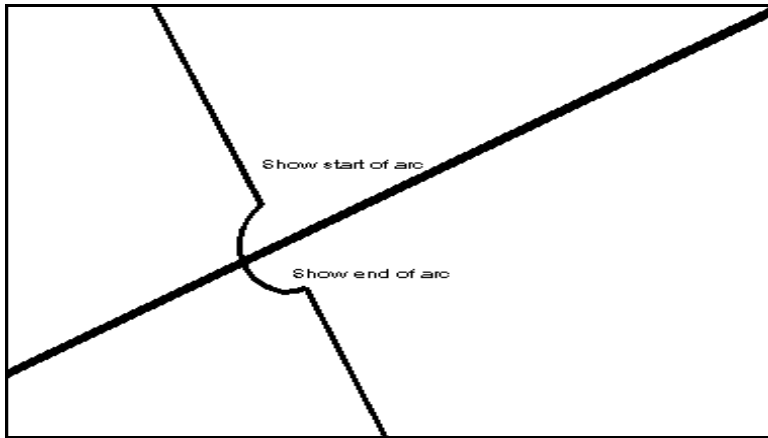


Figure 4-16 Jumpline Example

AutoSize – Laterals

IRRIGATION DESIGN ➡ PIPE ➡ AUTO SIZE LATERAL

KEY-IN COMMAND: `irsize lateral`

The purpose of the Auto Size Lateral command is to take an initial pipe layout, convert it to appropriately sized pipe objects and label the objects for graphical purposes at the same time. This makes it easy for you to convey to the contractor what pipe sizes should be used in the various parts of the pipe layout.

Once the AutoSize – Laterals dialog box is filled out and you click on OK, you are prompted to select the location of the valve. The program then reads the pipe branches and automatically sizes them.

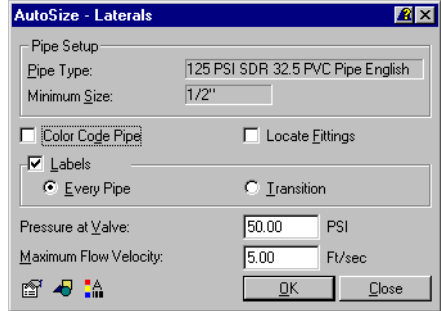





Figure 4-17 AutoSize – Laterals Dialog Box

AutoSize – Laterals Dialog Box Definitions

Option	Icon	Function
Pipe Setup		<ul style="list-style-type: none"> ➤ Pipe Type: This edit field displays the pipe type selected in the Pipe and Label Configuration dialog box (Figure 4-2 on page 48). ➤ Minimum Size: This edit field displays the minimum pipe size selected in the Pipe and Label Configuration dialog box (Figure 4-2 on page 48).
Color Code Pipe		This is the option to color code pipes to match the nominal size.
Locate Fittings		This is the option to automatically locate fittings.
Labels		Toggle this option on if you would like to place labels on the pipe segments. <ul style="list-style-type: none"> ➤ Every Pipe: This option allows you to label every pipe segment. ➤ Transition: This option allows you to label only at the pipe size change.
Pressure at Valve		This value is the water pressure available at the valve.
Maximum Flow Velocity		This value is the maximum velocity flow of water through the pipes.
Pipe/Label Configuration		Click on this icon to change the style, size, and labeling information for the pipe.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

1. **Select Pipe → Auto Size Lateral.**

The AutoSize – Laterals dialog box (Figure 4-17 on page 64) displays.

2. **Verify that the settings are correct. Click on the Pipe/Label Configuration icon to display the Pipe and Label Configuration dialog box (Figure 4-2 on page 48) if desired.**

3. **Click on OK.**

You are prompted for the valve location. The pipes are sized accordingly and you can then select the next valve.


AutoSize Mainline Wizard

IRRIGATION DESIGN ➤ PIPE ➤ AUTO SIZE MAINLINE

KEY-IN COMMAND: `irsizemainline`

The purpose of the Auto Size Mainline command is to take an initial pipe layout, convert it to the appropriately sized pipe objects, and label the objects for graphical purposes at the same time. This makes it easy for you to convey to the contractor what pipe sizes should be used in the various parts of the pipe layout.

Mainlines are always sized such that they are as large as the largest lateral that exists on any of the zones it is feeding. In rare instances (such as golf courses), you may toggle on Operate Multiple Zones Simultaneously. In those cases, the routine needs to account for the total flow running through each zone that is scheduled to operate at the same time. Obviously, you are prompted to select which valves are going to be run at the same time.

 *Leave the Operate Multiple Zones Simultaneously toggle off unless you are planning to run multiple zones at the same time.*

When you select the Auto Size Mainline command, a wizard guides you through the necessary steps.

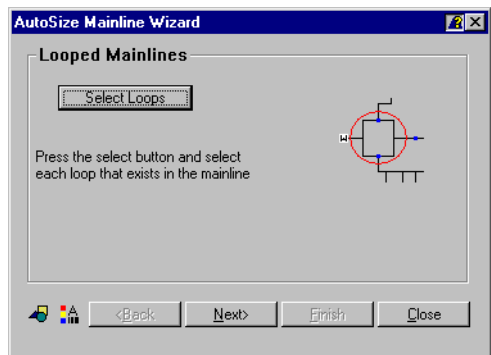




Figure 4-18 AutoSize Mainline Wizard Dialog Box – Looped Mainlines

AutoSize Mainline Wizard Dialog Box – Looped Mainlines Definitions

Option	Icon	Definition
Select Loops		Click on this button to select the mainline pipe that makes up the loop in your system.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

When you click on the Next button on the AutoSize Mainline Wizard dialog box – Looped Mainlines page, the dialog box below displays, prompting you to select any mainlines that are not part of a loop.

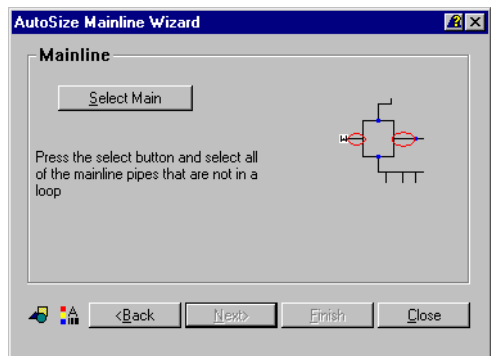




Figure 4-19 AutoSize Mainline Wizard Dialog Box – Mainline

AutoSize Mainline Wizard Dialog Box – Mainline Definitions

Option	Icon	Definition
Select Main		Click on this button to select additional mainline pipes that are not part of the loop.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

When you click on Next on the AutoSize Mainline Wizard dialog box – Mainline page, the dialog box below displays, prompting you to select the valves that are to be connected to the mainline.

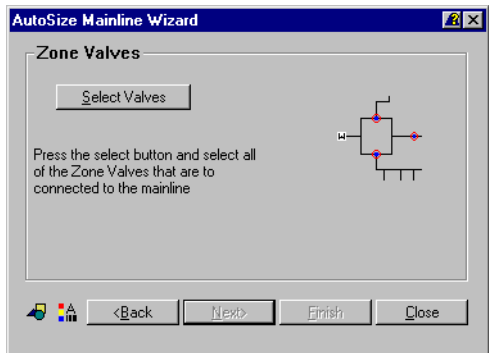




Figure 4-20 AutoSize Mainline Wizard Dialog Box – Zone Valves

AutoSize Mainline Wizard Dialog Box – Zone Valves Definitions

Option	Icon	Definition
Select Valves		Click on this button to select all valves associated with the selected mainline(s).
Operate Multiple Zones Simultaneously		Toggle this option on to select multiple zones to operate at the same time.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

When you click on the Next button on the AutoSize Mainline Wizard dialog box – Zone Valves page, the dialog box below displays.

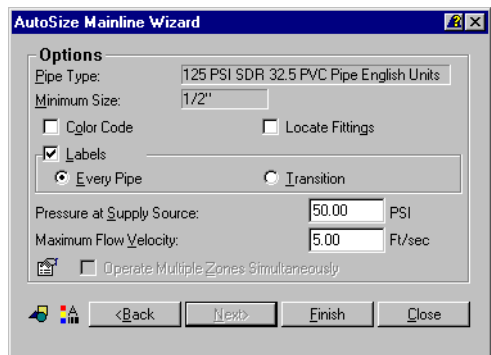





Figure 4-21 AutoSize Mainline Wizard Dialog Box – Options

AutoSize Mainline Wizard Dialog Box – Options Definitions

<i>Option</i>	<i>Icon</i>	<i>Definition</i>
Pipe Type		This edit field shows the type of pipe for the mainline pipe.
Minimum Size		This edit field shows the minimum size for the mainline pipe.
Color Code		Toggle this option on to color code the pipe.
Locate Fittings		Toggle this option on to automatically locate pipe fittings.
Labels		Toggle this option on if you would like to place labels on the pipe segments.
Every Pipe		This option allows you to label every pipe segment.
Transition		This option allows you to label only at the pipe size change.
Pressure at Supply Source		Enter the current static pressure of the system in this edit field.
Maximum Flow Velocity		Enter the number representing the maximum flow rate for the site in feet per second.
Pipe/Label Configuration		This icon displays the Pipe and Label Configuration dialog box (Figure 4-2 on page 48).
Operate Multiple Zones Simultaneously		Toggle this option on to select multiple zones to operate at the same time.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

Pipe Sleeve

IRRIGATION DESIGN ➤ PIPE ➤ PIPE SLEEVE

KEY-IN COMMAND: `irpipesleeve`

The Pipe Sleeve command locates pipe sleeves in your design. This is commonly used in a design when placing irrigation pipes under hard surfaces such as sidewalks and driveways, etc. When the size is specified, the totals appear in the irrigation table.

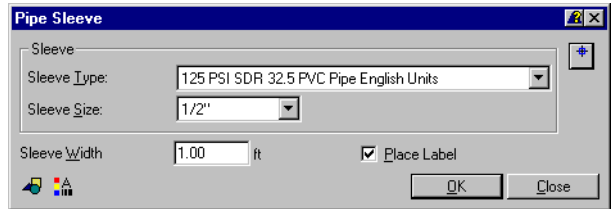


Figure 4-22 Pipe Sleeve Dialog Box

Pipe Sleeve Dialog Box Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Sleeve Type		Specify the desired type of pipe to be used for the sleeve from this drop list.
Sleeve Size		Specify the diameter of pipe to be used as the sleeve from this drop list.
Sleeve Width		Specify the distance that the sleeve is in width.
Place Label		Toggle this option on to place a pipe label on the section of pipe used as the sleeve.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text styles and/or layers/levels for the text to be placed in the CAD graphic.

QuickSteps

- 1. Select Pipe → Pipe Sleeve.**

The Pipe Sleeve dialog box (Figure 4-22 on page 69) displays.

- 2. Complete the sleeve type, size, and width information.**
- 3. If you would like to place a label, turn the Place Label toggle on.**
- 4. Click on OK.**
- 5. Select the start point of the sleeve.**
- 6. Select the end point of the sleeve.**
- 7. If you opted to place a label, you are prompted for the leader end point and location for the label.**


The sleeve is placed into the CAD graphic.

Edit Pipe Database

IRRIGATION DESIGN ⇨ PIPE ⇨ PIPE DATABASE EDITOR

KEY-IN COMMAND: `irpipedata`

The purpose of the Pipe Database Editor command is to allow you to view and/or modify the data associated with various pipe types. While new types of pipe do not come onto the market as frequently as new sprinkler heads do, this command does allow you to add new types of pipe if they do become available. It also gives you control over the data behind the pipe, so if larger pipe sizes are required you can enter this data as well.

 Larger pipe sizes, such as those used in agricultural irrigation, can be added to the **Irrigation Design** system using this command.

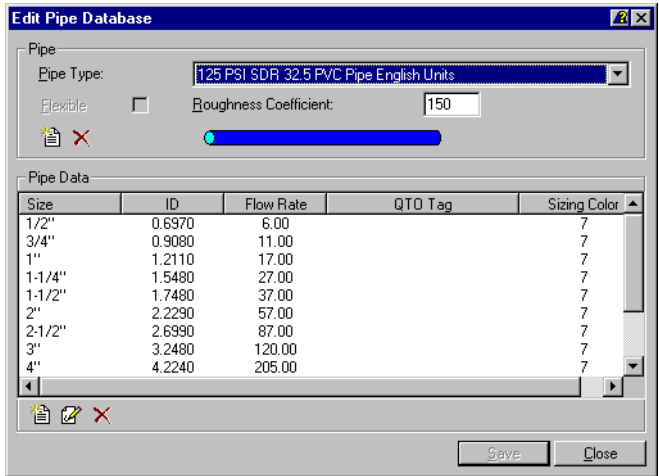







Figure 4-23 Edit Pipe Database Dialog Box

Edit Pipe Database Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Pipe Type		This drop list displays the type of pipe, i.e., PVC, Copper, Poly. These are all the pipes in the database.
Flexible		Toggle this on to allow bends in the pipe.
Roughness Coefficient		This is the coefficient of the roughness used in friction loss calculations.
Add New Pipe Type		This icon allows you to create a new pipe style and add it to your database.
Delete Pipe Type		This allows you to delete the selected pipe type from the database.
Size		This value is the current outside diameter of the pipe.
ID		This value is the inside diameter of the pipe.
Flow Rate		This value is the maximum flow rate in feet per second.
QTO Tag		This value is a number that is assigned for Quantity Takeoff purposes.
Sizing Color		This value is the color number assigned to the pipe once sizing has been completed.
Add New Pipe Data		This icon allows you to add additional pipe sizes to your database.
Modify Pipe Data		Clicking on this icon allows you to modify the data for the selected pipe size.

Edit Pipe Database Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Delete Pipe Data		This icon allows you to delete the selected pipe size from the database.

QuickSteps

1. Select Pipe → Pipe Database Editor.

The Edit Pipe Database dialog box (Figure 4-23 on page 71) displays.

2. Choose the type of pipe to edit.

3. Verify or edit the data.

4. Click on Save to activate the changes.

5. Click on Close to dismiss the dialog box.

Critical Head

KEY-IN COMMAND: `incriticalhead`

The purpose of the Critical Head command is to show you the sprinkler which has the greatest pressure loss from the valve to the head. Often, this is simply the head that is the farthest from the valve, but other factors such as elevation, number of sprinklers, and fittings between the head and the valve, etc., may result in a different head being displayed. The total distance and pressure loss for that head are also displayed.

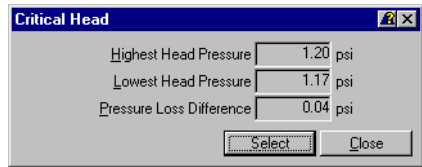


Figure 4-24 Critical Head Dialog Box

Critical Head Dialog Box Definitions

Option	Function
Highest Head Pressure	This field displays the highest operating pressure of the head in the selected zone.
Lowest Head Pressure	This field displays the lowest operating pressure of the head in the selected zone.
Pressure Loss Difference	This field displays the difference between the highest and lowest pressures.

QuickSteps

1. **Select Pipe → Critical Head.**
2. **Pick the zone valve desired.**
3. **Observe the display to see which is the critical head.**

Pressure loss and total distance are displayed on the CAD command line.

DRIP

The Drip menu contains commands related to designing both traditional drip systems with emitters and spaghetti tubing intended to water individual plants, as well as subsurface drip systems used for covering areas.

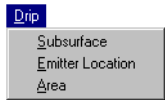


Figure 5-1 Drip Menu

In this chapter:

<i>Subsurface Wizard</i>	76
<i>Emitter Location</i>	80
<i>Drip Area</i>	83

CHAPTER

5

Subsurface Wizard

IRRIGATION DESIGN ➤ DRIP ➤ SUBSURFACE

KEY-IN COMMAND: `irsubsurface`





The purpose of the Subsurface command is to provide a utility for laying out Netafim-type subsurface drip irrigation systems. These systems are typically used for watering shrub beds and other areas by applying water directly to the root zone. The systems consist of two PVC pipes, one as a header and one as a footer, with flexible polyethylene (PE) pipe in between. The PE pipe is spaced between 12" and 24" apart. In the PE pipe are emitter holes (small openings in the pipe), every 12" to 24". Thus, a grid pattern can be obtained with water supplied to the soil every foot or so apart in both directions.

In the Subsurface Wizard, you are asked to choose Select Existing or Draw New for the Header, Footer, First Drip Line, and Calculations. The first page of the Wizard asks for the header. Once you have supplied this information, the remaining pages of the Wizard display so that you can supply the footer, first drip line, and calculations.



Figure 5-2 Subsurface Wizard Dialog Box

Subsurface Wizard Dialog Box Definitions



Option	Icon	Function
Header		Select Existing: Select an existing entity that represents the header. Draw New: Draw a new entity to display the header.
Footer		Select Existing: Select an existing entity that represents the footer. Draw New: Draw a new entity to display the footer.
First Drip Line		Select Existing: Select an existing entity that represents the drip line. Draw New: Draw a new entity to represent the drip line.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and text style. You may also define line thickness.

Subsurface Wizard – Calculations




Figure 5-3 Subsurface Wizard – Calculations Dialog Box

Subsurface Wizard – Calculations Dialog Box Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Application		This icon toggle allows you to select applications of shrubs or turf; it also sets the Application Rate appropriately.
Soil Type		Choose from three types of soil: loam, sand, and clay. This option also sets the Application Rate appropriately.
Dripper Flow		Measured in GPH (gallons per hour), as this value is modified, the Application Rate also updates.

Subsurface Wizard – Calculations Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Dripper Spacing		This option enables you to define dripper spacing. As it is updated, the Application Rate also updates automatically.
Drip Line Spacing		This value defines spacing between each drip line.
Application Rate		This value updates based on application, soil type, dripper flow, and dripper spacing.
Symbol Scale		This value controls the size of the flush valve, zone valve, etc.
Associate with Zone		This option assigns a zone ID for the zone calculations report. The drop list contains zones defined for this project.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

QuickSteps

1. **Select Drip → Subsurface.**
2. **Click on the Select Existing button or Draw New button for a header and select or draw the header.**
3. **Click on the Select Existing button or the Draw New button for a footer and select or draw the footer.**
4. **Click on the Select Existing button or the Draw New button for the first drip line and select or draw the first drip line.**

The Subsurface Wizard Dialog Box (Figure 5-3 on page 77) displays.

5. **Select the desired Application using the icon toggle.**
6. **Select the desired Soil Type.**
7. **Select the desired Dripper Flow, Dripper Spacing, and Drip Line Spacing.**
8. **Select a Symbol Scale.**
9. **Select a Zone ID Number from the Associate with Zone drop list.**
10. **Click on Finish.**

You are prompted:

Select Point on Header where Zone Valve will attach.

11. **Select a point on the header where the zone valve attaches.**

You are prompted:

Select Point where the Zone Valve will be placed.

12. **Select a point where the zone valve is placed.**

You are prompted:

Select Point on Footer where the Flush Valve will attach.

13. Select a point on the footer where the flush valve attaches.

You are prompted:

Select Point where the Flush Valve will be Placed.

14. Select a point where the flush valve is placed.

The subsurface system is drawn.

Examples

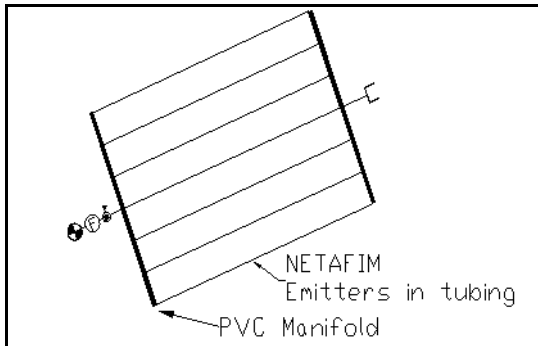


Figure 5-4 Drip Subsurface Example

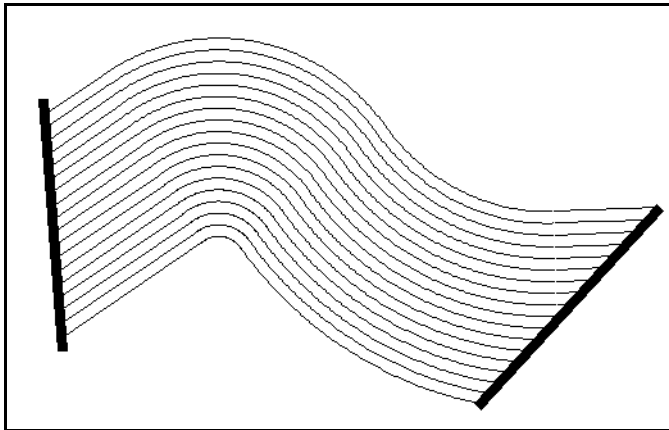


Figure 5-5 Parallel Tubing Example

Emitter Location

IRRIGATION DESIGN ➤ DRIP ➤ EMITTER LOCATION

KEY-IN COMMAND: `iremitter`

The Emitter Location command locates individual emitters for each selected plant and draws the drip tubing if necessary. If individual emitters are shown, you may want to specify the flow rate of each emitter (shrubs might use a one-GPH emitter, while trees in the same planting area might use two-GPH emitters). The number of emitters per tree or per shrub might vary (in some cases, each shrub gets only one emitter per plant, while a tree might get three emitters). On some commercial jobs, this level of detail is required. This gives you flexibility in how you want to show the drip system on your plan.

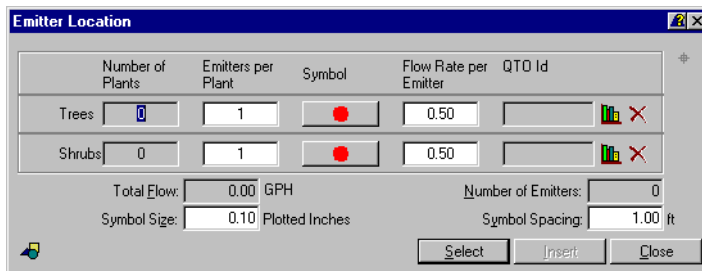



Figure 5-6 Emitter Location Dialog Box

Emitter Location Dialog Box Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Number of Plants		This edit field displays the number of plants chosen for the drip irrigation for trees and shrubs.
Emitters per Plant		This edit field displays the number of emitters per plant.
Symbol		Select the graphic of the symbol to insert.
Flow Rate per Emitter		This edit field displays the flow rate per emitter in gallons per hour.
QTO Link		Click on this icon to launch the Quantity Takeoff database. You will assign the QTO ID or add the proper QTO ID at this time.
Clear QTO Tag		Click on this icon to delete the selected QTO ID.

Emitter Location Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Total Flow		This edit field displays the flow emitters in gallons per hour.
Symbol Size		This edit field displays the size of the graphical symbol for the emitter.
Number of Emitters		This edit field displays the total number of emitters.
Symbol Spacing		This option allows you to define the distance that the emitter symbol should be placed from the plant symbol.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

QuickSteps

1. Select Drip → Emitter Location.

You are prompted to select plant material from your CAD graphic.

2. Select plant material from your CAD graphic and press Enter.

The Emitter Location dialog box (Figure 5-6 on page 80) displays, showing the total number of trees and shrubs selected.

3. Choose an appropriate symbol for the tree emitters and indicate the number of emitters to be located per tree.

4. Specify the flow rate per emitter.

5. Perform steps 3 and 4 for the shrubs.

The total number of emitters and flow are calculated.

6. Verify the symbol size.

7. Click on Insert.

Emitters are placed in the CAD graphic with the appropriate data attached to the plant material you selected in step 2.

Example

This is an example showing both the area method and the individual emitter method. Notice how you have different emitters on the trees versus the shrubs, as well as three emitters per tree and only one per shrub.

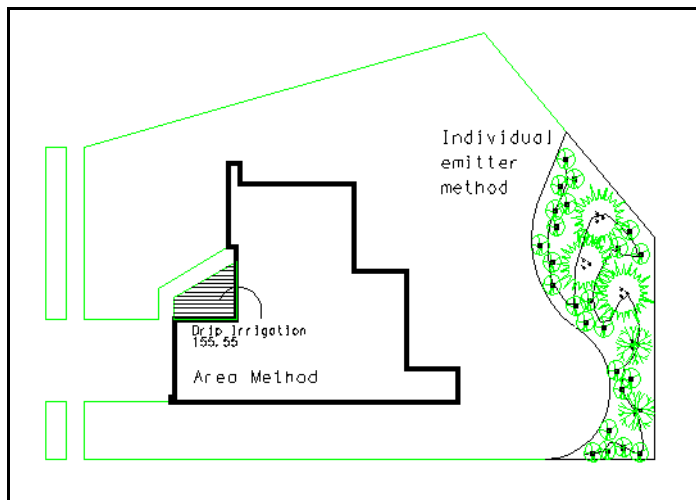


Figure 5-7 Area Method and Individual Emitter Method Example

Drip Area

KEY-IN COMMAND: `indriparea`

The purpose of the Area command is to locate areas on the plan that are to be specified as drip, without showing all of the actual emitters. If an area is used, then typically a price is assigned based on square footage, and the contractor is simply responsible for installing a system in the field that works. For many residential situations, this is adequate.




Figure 5-8 Drip Area Dialog Box

Drip Area Dialog Box Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Boundary		<ul style="list-style-type: none">➤ Draw: Draw a new boundary for the drip irrigation.➤ Select Existing: Select an existing boundary.➤ Area: This edit field displays the calculated area of the boundary.
Hatch		<p>Toggle this option on if you want to place a hatch pattern in the drip area.</p> <ul style="list-style-type: none">➤ Angle: Enter the angle of the hatch.➤ Line Spacing: Enter the spacing of the hatch.
Label		<p>Toggle on this option to place a label in the drip area.</p> <ul style="list-style-type: none">➤ Text: Enter the label you wish to display in this edit field.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

Drip Area Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Text Properties		This option allows you to specify the text style, color, and/or layer/level for the text to be placed in the CAD graphic.

QuickSteps

- 1. Select Drip → Area.**

The Drip Area dialog box (Figure 5-8 on page 83) displays.

- 2. Click on Select Existing to select a closed polyline in the CAD graphic to denote the boundary.**

- 3. Pick the desired polyline in CAD.**

- 4. Turn on the Hatch toggle and indicate a hatch angle and spacing.**

- 5. Turn on the Label toggle and insert a text string such as “Area to be dripped.”**

- 6. Click on Apply.**

You are prompted to pick a location for the label.

- 7. Pick a location for the label in CAD and then pick a point in CAD for the desired hatch angle.**

The label is placed and the drip area is hatched.

SYMBOLS

The Symbols menu is used to locate irrigation equipment symbols that are not otherwise accounted for in an irrigation design. Symbols such as sprinkler heads, valves, etc., that are located elsewhere are not duplicated here. However, symbols such as filters, back flow preventers, and detail components are available from this menu. You can also create a symbols table or legend using the commands on this menu.

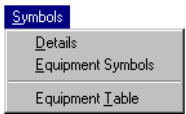


Figure 6-1 Symbols Menu

In this chapter:

<i>Details</i>	86
<i>Equipment Symbols</i>	88
<i>Symbol Table</i>	89

Details

IRRIGATION DESIGN ➤ SYMBOLS ➤ DETAILS

The Details command inserts component pieces so that you can create your own irrigation details. These details are not the same as Eagle Point's **Construction Details** module. Rather, they are simple drawings, which when placed together with other drawing entities and text, can be made into details for a particular project. When this command is selected, the Symbol library dialog box (below) and the Settings dialog box (Figure 6-3 on page 87) display.

Symbol Library

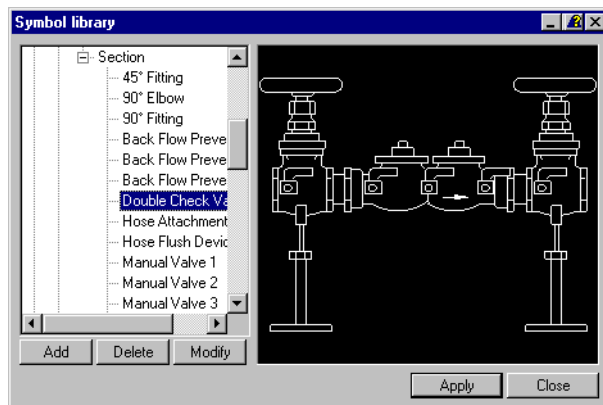


Figure 6-2 Symbol Library Dialog Box

Symbol Library Dialog Box Definitions

Option	Function
List Box	This is a complete listing of all the symbols. You may select one from the list or the graphic.
Graphic	This is a graphical representation of all the symbols. You may select one from the graphic or the list.
Add	Clicking on the Add button allows you to add your own symbols to the Symbols Library.
Delete	Click on the Delete button to remove the highlighted symbol from the Symbols Library.
Modify	Clicking on the Modify button allows you to modify your symbols within the Symbols Library.

Settings – Scale/Rotation

IRRIGATION DESIGN ⇨ SYMBOLS ⇨ DETAILS

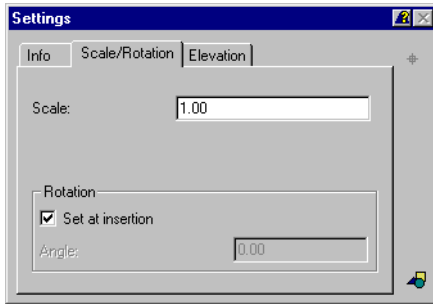




Figure 6-3 Settings Dialog Box – Scale/Rotation Tab

Settings Dialog Box – Scale/Rotation Tab Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.
Scale		This value is the size of the symbol when it is inserted into the CAD graphic.
Rotation		This is the rotation angle of the symbol when it is inserted into the CAD graphic.
Set at insertion		Toggle on this option to set an insertion point on the screen.
Angle		Input the rotation angle directly if Set at insertion is not toggled on.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

QuickSteps

1. Select Symbols → Details.

The Symbol Library dialog box (Figure 6-2 on page 86) and Settings dialog box (above) display.

2. Click on the Preview Image button showing the current symbol.

3. From the Symbol Library dialog box, choose a new symbol to insert.

4. Set your options in the Settings dialog box.

5. Click on Apply in the Symbol library dialog box.

You are prompted for an insertion point.

6. Select a point for the symbol.

The symbol is inserted.

Example

This is an example of how two detail components can be used to create a new construction detail.

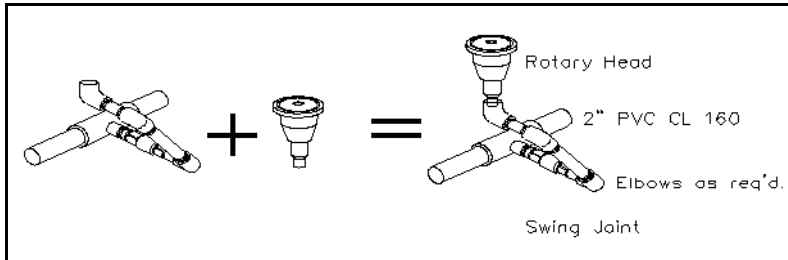



Figure 6-4 Detail Components Example

Equipment Symbols

IRRIGATION DESIGN ➤ SYMBOLS ➤ EQUIPMENT SYMBOLS

The purpose of the Equipment Symbols command is to insert any irrigation equipment symbols that are not otherwise inserted into your design. This includes items such as water meters, back flow preventers, filters, and other peripheral equipment. When this command is selected, the Symbol Library dialog box (Figure 6-2 on page 86) and Settings dialog box (Figure 6-3 on page 87) display.

 *Use a preset scale factor to insure that all of your symbols are a consistent size in your design.*

QuickSteps

1. Select Symbols → Equipment Symbols.

The Symbol Library dialog box (Figure 6-2 on page 86) and Settings dialog box (Figure 6-3 on page 87) display.

2. Choose the desired symbol from the Symbol Library dialog box.

3. Enter a scale or rotation angle from the Settings dialog box if desired.


4. Insert the symbol into your design by clicking on Apply in the Symbol Library dialog box and selecting a point in the CAD graphic.

Symbol Table

IRRIGATION DESIGN ⇨ SYMBOLS ⇨ EQUIPMENT TABLE

KEY-IN COMMAND: `irtable`

The purpose of the Equipment Table command is to create a legend in the CAD graphic of all components used in the irrigation design. Often this is a desirable method for explaining which symbols are used to represent certain sprinklers, rather than labeling each individual sprinkler. This also gives a quick visual tool as to what quantities of each item are used in the plan.

 Be sure to set the text height and font used in the settings options before running this command.

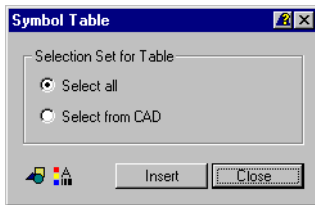




Figure 6-5 Symbol Table Dialog Box

Symbol Table Dialog Box Definitions

Option	Icon	Definition
Select All		Turn this radio button on to select all entities in the CAD graphic.
Select from CAD		Turn this radio button on to select the entities using a selection set.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This option allows you to specify the text style and/or layer/level for the text to be placed in the CAD graphic.

QuickSteps

1. Select Symbols → Equipment Table.

The Symbol Table dialog box (Figure 6-5 on page 89) displays.

2. Set your options in the dialog box and click on Insert.

3. Specify in CAD the insertion point for the table.

4. Click on Close when finished to dismiss the Symbol Table dialog box.

Example

The following is an example of the output.

Qty	Pipe
23	1" 125 PSI SDR 32.5 PVC PIPE ENGLISH UNITS
31	1-1/2" 125 PSI SDR 32.5 PVC PIPE ENGLISH UNITS
13	1-1/4" 125 PSI SDR 32.5 PVC PIPE ENGLISH UNITS
66	1/2" 125 PSI SDR 32.5 PVC PIPE ENGLISH UNITS
15	3/4" 125 PSI SDR 32.5 PVC PIPE ENGLISH UNITS
Qty	Equipment
1	Backflow Preventor
1	EP1R_VALVE_RC 1-1/2"
1	Filter
Qty	Sprinkler Head
16	TR570MPR 15-F
24	TR570MPR 15-H
7	TR570MPR 15-O
4	TR570MPR 15-T
7	TR570MPR 15-TQ
3	TR570MPR 15-TT

Figure 6-6 Output Example

TOOLS

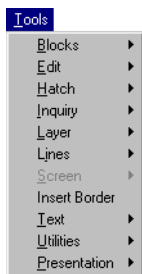


Figure 7-1 Tools Menu

In this chapter:

<i>Blocks</i>	92
<i>Edit</i>	101
<i>Hatch</i>	107
<i>Inquiry</i>	113
<i>Layer</i>	123
<i>Lines</i>	133
<i>Insert Border</i>	143
<i>Text</i>	144
<i>Utilities</i>	155
<i>Presentation</i>	160

CHAPTER

7

Blocks

IRRIGATION DESIGN ➤ TOOLS ➤ BLOCKS

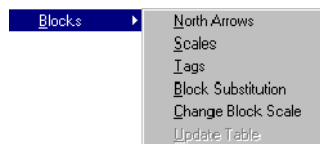


Figure 7-2 Blocks Submenu

Insert North Arrow

IRRIGATION DESIGN ➤ TOOLS ➤ BLOCKS ➤ NORTH ARROWS

KEY-IN COMMAND: `irnortharrow`

ICON: 

The North Arrows command allows you to insert various symbols representing a North Arrow in the CAD graphic. North Arrows are needed to reference directions and angles that may be provided on items such as property lines or sidewalks.

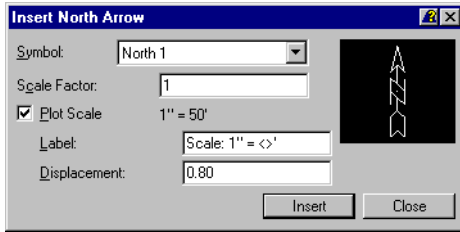


Figure 7-3 Insert North Arrow Dialog Box

Insert North Arrow Dialog Box Definitions

<i>Option</i>	<i>Function</i>
Symbol	This drop list allows you to select a North Arrow by name.
Scale Factor	This value defines the size of the symbol.
Plot Scale	This value is the scale at which the design is plotted.
Label	This is the description of the scale.
Displacement	This value is the distance of the label from the North Arrow.

QuickSteps

To insert a North Arrow, complete the following steps.

- Select Tools → Blocks → North Arrows.**
The Insert North Arrow dialog box (above) displays.
- Select the North Arrow to use from the drop list.**
- Enter the Scale Factor for the North Arrow.**
- Toggle on the Plot Scale if desired.**
- Click on Insert and position the arrow in the CAD graphic.**

Example

The following is a North Arrow example.



Figure 7-4 North Arrow

Insert Bar Scale

IRRIGATION DESIGN ➤ TOOLS ➤ BLOCKS ➤ SCALES

KEY-IN COMMAND: `irbarscale`

ICON: 

The Scales command allows you to insert various symbols representing bar scales into the CAD graphic and to specify the design scale. The design scale is useful when plotting hard copies of the CAD graphic. When referencing the CAD graphic sheet you can use a scale to measure and verify distances in the field.

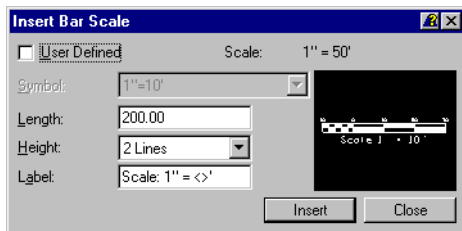


Figure 7-5 Insert Bar Scale Dialog Box

Insert Bar Scale Dialog Box Definitions

Option	Function
User Defined	Toggle this option on if you want to place a user defined bar scale. This enables the Symbol drop list and disables the Length, Height, and Label fields. If this toggle is on, the Length, Height, and Label options are used to construct a bar scale at the time you click on the Insert button.
Scale	This value is the scale at which the design is plotted.
Symbol	Select the symbol from a variety of predefined scales.
Length	This edit field allows you to specify the length of the bar scale that is placed when you have the User Defined option toggled off.
Height	This drop list allows you to specify how many lines are used for the bar scale when you have the User Defined option toggled off. The available options are one or two lines.
Label	This edit field allows you to specify how you want the bar scale to be labeled when it is placed when the User Defined option is toggled off.

QuickSteps

1. **Select Tools → Blocks → Scales.**

The Insert Bar Scale dialog box (Figure 7-5 on page 94) displays.

2. **Select the desired scale symbol or name.**
3. **Complete the Length, Height, and Label information.**
4. **Click on Insert and position the symbol in the CAD graphic.**

Example

The figure below is an example of the Scales command.

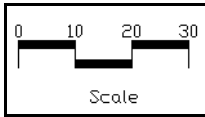


Figure 7-6 Scale Example

Tags

IRRIGATION DESIGN ➤ TOOLS ➤ BLOCKS ➤ TAGS

KEY-IN COMMAND: `irtag`

The Tags command allows you to insert various symbols representing tags into the CAD graphic, and in some instances, to specify text associated with the tags. A tag could be used to call out a specific detail of an item. For example, when laying out a sidewalk, it may go between an existing grove of trees. You may wish to place a tag stating that on-site modification may be needed to avoid the drip line.

Symbol Library

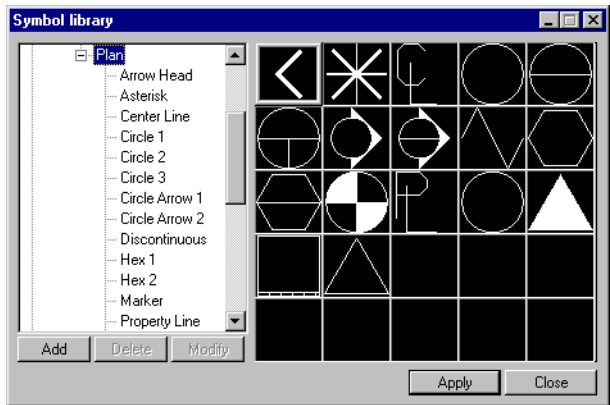


Figure 7-7 Symbol Library Dialog Box

Symbol Library Dialog Box Definitions

Option	Function
List Box	This is a complete listing of all the tags. You may select one from the list or the graphic.
Graphic	This is a graphical representation of all the tags. You may select one from the graphic or the list.
Add	Clicking on the Add button allows you to add your own symbols.
Delete	Click on the Delete button to remove the highlighted symbol.
Modify	Clicking on the Modify button allows you to modify your symbols.

QuickSteps

1. **Select Tools → Blocks → Tags.**
The Symbol Library dialog box (above) displays.
2. **Select the desired tag and click on Apply.**
3. **Graphically insert the tag into the CAD graphic.**

Example

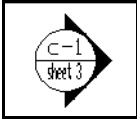


Figure 7-8 Tags Example

Block Substitution

IRRIGATION DESIGN ➤ TOOLS ➤ BLOCKS ➤ BLOCK SUBSTITUTION

KEY-IN COMMAND: `irblocksubst`

ICON: 

The Block Substitution command allows you to exchange one CAD graphic symbol for another. This can be extremely useful when doing presentations. The CAD graphic can have plan view symbols to speed up regeneration and drafting time. Then, as needed, it can quickly be converted into 3-D to view during presentations, then converted back to plan view to make any changes or revisions.

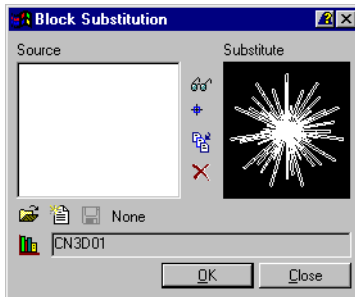










Figure 7-9 Block Substitution Dialog Box

Block Substitution Dialog Box Definitions

Option	Icon	Function
Source		This is a list of all current blocks in the CAD graphic. Highlight the block(s) that you want substituted.
Substitute		This is a graphic preview of the symbol which is substituted for the blocks which were highlighted in the Source list.
Highlight Blocks in Drawing		This option shows the selected item in the CAD graphic.

Block Substitution Dialog Box Definitions

Option	Icon	Function
Select Block		This option allows you to select the source block/cell from the CAD graphic.
Add to Substitute File		This option allows you to add the selected symbol into a file.
Delete		This icon allows you to delete the symbol from the substitute view.
Open Substitute File		This icon displays a Windows Open dialog box, allowing you to select a block substitute file to open.
New Substitute File		This icon allows you to add a new substitute file.
Save Substitute File		This icon allows you to save the current substitute file.
Symbols from Organizer		This option allows you to select the desired block/cell to substitute from the Symbol Library (Figure 7-7 on page 96).

QuickSteps

1. Select Tools → Blocks → Block Substitution.

The Block Substitution dialog box (Figure 7-9 on page 97) displays with the existing blocks in your CAD graphic which are available for substitution.

2. Click on the New Substitute File icon.

3. Enter a subfile name of `mysub` and click on Save.

4. Highlight the block(s) under the source column that you want to substitute.

5. Click on the Symbols from Organizer icon in the bottom left corner of the dialog box.


6. Select a substitute block from the Symbol Library dialog box and click on Apply.

The selected substitute displays in the Block Substitution dialog box (Figure 7-9 on page 97).

7. Click on the Add to Substitute File icon.

8. Click on OK.

The source blocks are replaced with the newly selected block.

 This utility substitutes CAD symbology only – attributes of the insertion remain the same.

Example

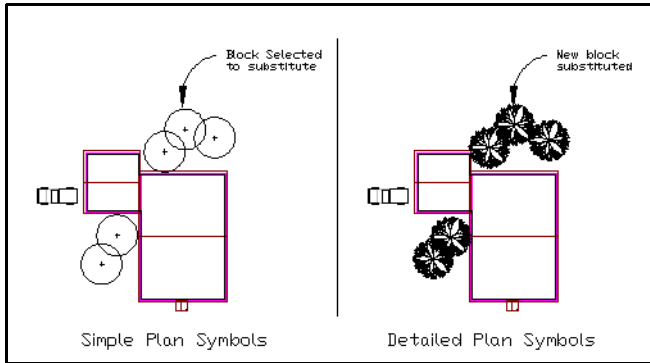
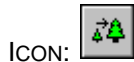


Figure 7-10 Substitute Example

Change Scale

IRRIGATION DESIGN ➤ TOOLS ➤ BLOCKS ➤ CHANGE BLOCK SCALE

KEY-IN COMMAND: `irblockscale`



The Change Block Scale command allows you to change the X, Y, Z scales of selected blocks/cells. This command can be used when you want to change the height of a tree symbol. By using this command, the height can easily be modified without having to erase it and reinsert the symbol.

Typically you want the X and Y scale factors to correspond to each other. This is also a quick way to change the height of a tree symbol without having to reinsert it.

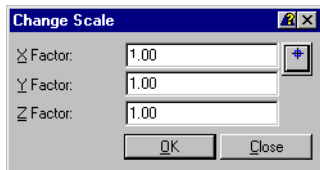



Figure 7-11 Change Scale Dialog Box

Change Scale Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
X Factor		Type a value in this edit field to adjust the size of the symbol in the X direction, or the width of a symbol.
Y Factor		Type a value in this edit field to adjust the size of the symbol in the Y direction, or the length of a symbol.
Z Factor		Type a value in this edit field to adjust the size of a symbol in the Z direction, or the height of a symbol.
PIC		This option allows you to select the source block/cell from the CAD graphic.

QuickSteps

- 1. Select Tools → Blocks → Change Block Scale.**
- 2. Enter the appropriate scale changes and click on OK.**
You are prompted to select objects.
- 3. Graphically select the desired blocks/cells and press Enter.**
The selected objects are updated with the new scaling factors.

Example

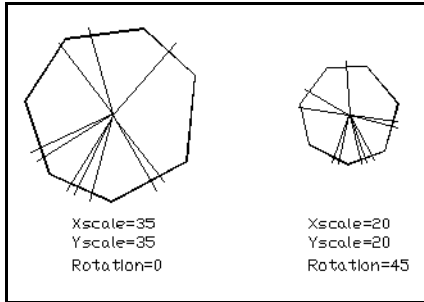


Figure 7-12 Change Scale Example

Edit

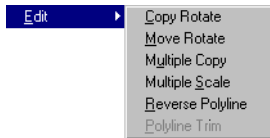


Figure 7-13 Edit Submenu

Copy and Rotate



KEY-IN COMMAND: `ircopyrotate`



The Copy and Rotate command allows you to select an object and copy it to a different location and then rotate the object without having to run two separate commands. This command is extremely useful for locating plant material. A single symbol may be inserted, then copied and rotated to all other locations using this command.

Use this command to give plant symbols more of a varied or random look.

QuickSteps

1. Select Tools → Edit → Copy Rotate.

You are prompted to select objects.

2. Graphically select the object to be copied and rotated and press Enter.

You are prompted to select the base point.

3. Graphically select a base reference point from which you want the object copied.

You are prompted for the second point.

4. Graphically select the location to which you want the object copied.

You are prompted for the rotation angle.

5. Graphically select the new rotation for the object.

The object is copied and rotated to the new settings.

Example

This example shows you how to copy a tree symbol from one location to another and rotate it 270 degrees.

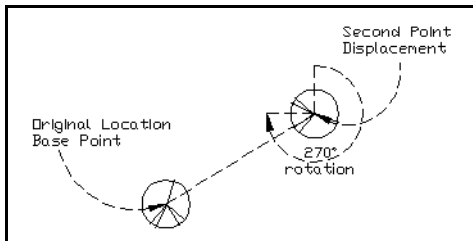


Figure 7-14 Copy and Rotate Example

Move and Rotate

IRRIGATION DESIGN ➤ TOOLS ➤ EDIT ➤ MOVE ROTATE

KEY-IN COMMAND: `irmoverotate`



The Move and Rotate command allows you to select an object and move it to a different location and then rotate the object without having to run two separate commands. For example, you may have created a building footprint utilizing ortho and oriented the house at 90-degree angles. You can then use this command to move it and rotate it to its correct position on the site.

QuickSteps

- 1. Select Tools → Edit → Move Rotate.**
You are prompted to select objects.
- 2. Graphically select the object to be moved and rotated and press Enter.**
You are prompted to select the base point.
- 3. Graphically select the base point from which you want the object moved.**
You are prompted for the second point.
- 4. Graphically select the new location for the object.**
You are prompted for the rotation angle.
- 5. Graphically select the new rotation angle for the object.**
The object is moved and rotated to the new settings.

Example

The following is an example of moving a tree symbol from its original location to a new location and rotating it 270 degrees.

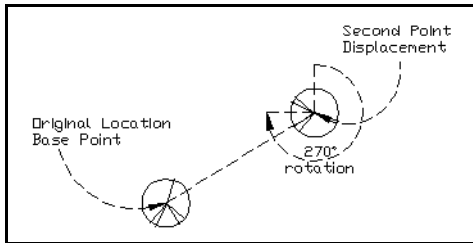


Figure 7-15 Move and Rotate Example

Multiple Copy

IRRIGATION DESIGN → TOOLS → EDIT → MULTIPLE COPY

KEY-IN COMMAND: `irmulticopy`



The Multiple Copy command allows you to make multiple copies of an object or objects. For example, you may have a parking lot on the site and wish to have car symbols placed in the stalls. You could insert a single car and use this command to copy it to multiple locations without having to run the insertion routine every time.

 *This command is useful for placing multiple copies of the same plant type.*

QuickSteps

- 1. Select Tools → Edit → Multiple Copy.**
You are prompted to select objects.
- 2. Graphically select the objects to be copied and press Enter.**
You are prompted to enter the base point.
- 3. Graphically select the point to be copied from.**
You are prompted for the second point.
- 4. Graphically select the new locations for the objects.**

Example

This example shows you how to copy a tree symbol from its original location to several other locations.

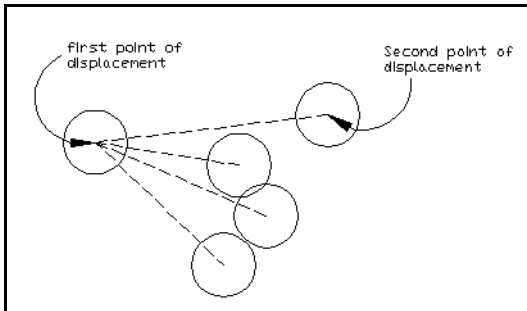


Figure 7-16 Multiple Copy Example

Change Scale

IRRIGATION DESIGN ➤ TOOLS ➤ EDIT ➤ MULTIPLE SCALE

KEY-IN COMMAND: `irmultiscale`



This command is useful for changing the crown diameter of multiple plant symbols without losing the insertion location.

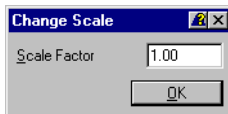


Figure 7-17 Change Scale Dialog Box

Change Scale Dialog Box Definition

Option	Function
Scale Factor	Type the desired scale factor in the edit field. A value of 1.0 causes the symbols to remain the same size; values less than 1 but greater than 0 cause the symbols to decrease in size while values greater than 1 cause the symbols to increase in size.

QuickSteps

1. Select Tools → Edit → Multiple Scale.

The Change Scale dialog box (Figure 7-17 on page 105) displays.

2. Enter a scale factor desired in the edit field and click on OK.

You are prompted to select objects.

3. Graphically select the objects to be scaled and press Enter.

The selected objects are scaled from their insertion points.

Example

The following is an example of scaling multiple symbols to half of their original size, without losing the insertion point of each symbol.

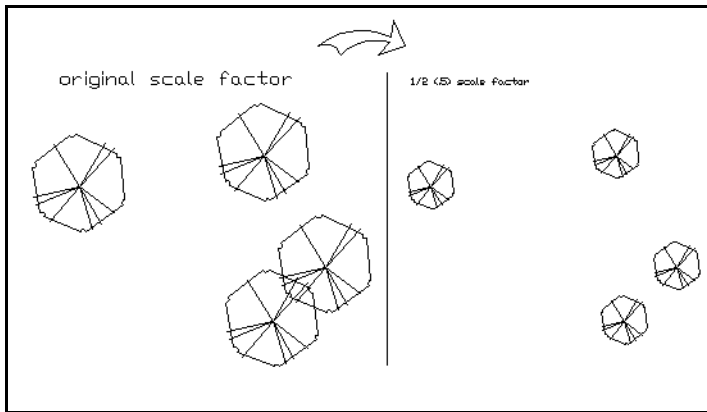


Figure 7-18 Multiple Scale Example

Reverse Polyline

IRRIGATION DESIGN TOOLS EDIT REVERSE POLYLINE

KEY-IN COMMAND: `irrevpoly`

The Reverse Polyline command reverses the direction of a polyline, line, or arc segment. This command is particularly useful if contour labeling text comes in upside down. You can run the Reverse Polyline command and then rerun the Label command and the labels display in the correct direction.

Use this command if contour labels display upside down.

QuickSteps

1. Select Tools → Edit → Reverse Polyline.

You are prompted to select a line, a polyline, or an arc to reverse direction.

2. Graphically select the desired objects and press Enter.

The directions of the selected objects are reversed.

Example

Below is an example of reversing the direction of a polyline so that the text label comes in oriented to the desired direction.

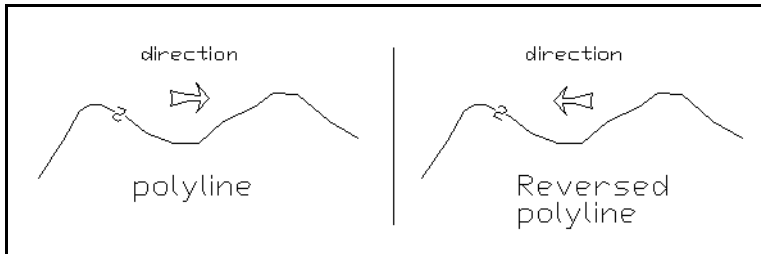


Figure 7-19 Reverse Polyline Example

Hatch



Figure 7-20 Hatch Submenu


Edge Stipple

IRRIGATION DESIGN ⇨ TOOLS ⇨ HATCH ⇨ EDGE STIPPLE

KEY-IN COMMAND: `irstipple`



The Edge Stipple command is used to graphically indicate turf areas or other irregular shaped planting beds by inserting a large number of dots along the edge of the area and gradually fading to fewer and fewer dots in the center. This technique is often used for rendering plan view site plans.

 *Always use a closed polyline as the border of your stippled area. A polyline that is not closed may work, but the results are unpredictable. Use simple areas with polylines that have not been splined.*

✓ ***Do not use an area that is very small in one corner and very large in another area (use two polylines instead), as you do not want the offsets to overlap and give you poor results.***

✓ ***Do not use a splined polyline.***

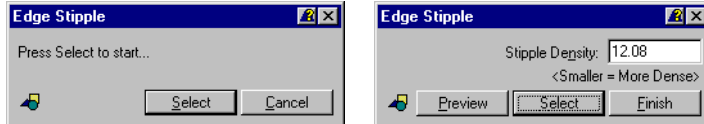



Figure 7-21 Edge Stipple Dialog Box

Edge Stipple Dialog Box Definitions

Option	Icon	Function
Stipple Density		<p>The number displayed is the scale of the hatch that is to be placed into the defined area. The smaller the number, the tighter the scale.</p> <p>✓ <i>The scale (density) can also take a lot of memory if set too small. Reduce the numbers cautiously.</i></p>
CAD Settings		Clicking on this icon allows you to edit the layer/level, color, and linetype/linestyle of objects.
Preview		This option will allow you to see the pattern before it is placed into the drawing. This can help reduce the possibility of locking up the computer with a hatch scale that is too small.
Select		The Select option allows you to select another polyline to stipple if you change your mind.

Edge Stipple Dialog Box Definitions

Option	Icon	Function
Finish		This option will apply the hatch to the selected area and close out the command.

QuickSteps

1. **Draw a closed polyline to define the area to be stippled.**

2. **Select Tools → Hatch → Edge Stipple.**

The Edge Stipple dialog box (Figure 7-21 on page 108) displays.

You are prompted to select a closed polyline.

3. **Select a closed polyline.**

You are prompted to select a point.

4. **Select a point near the center of the area to be stippled.**

The preview lines are pre-inserted into your design.

5. **Click on No if the result is acceptable. Click on Yes if you want to modify the spacing between the dots.**

If Yes is chosen, you are prompted to select a point.

After the new point is selected, the command loops back to step 5, allowing you to retry until you are satisfied. Once No is selected, the stippling is inserted into your design.

Example

The following is an example of the Edge Stipple command.

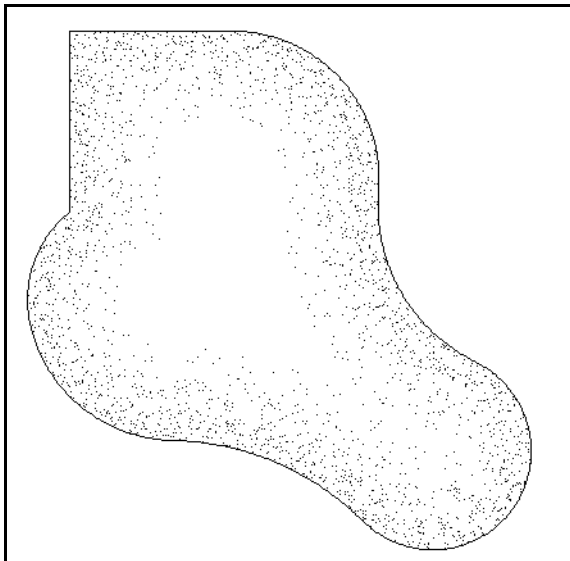


Figure 7-22 Edge Stipple Example



Hatch Faces

IRRIGATION DESIGN ➤ TOOLS ➤ HATCH ➤ HATCH FACE

KEY-IN COMMAND: `irhatchface`



The Hatch Face command allows you to hatch areas with different patterns to represent different elements. For example, you could have several elements in the site that cannot be represented by blocks. You can create a closed polyline and apply a hatch pattern to represent the desired material (e.g., turf, concrete, paving, etc.).

-  **Some patterns that have more detail will take longer to preview.**
-  **Make sure that you have a closed polyline or bounded area in the CAD graphic before running this command.**

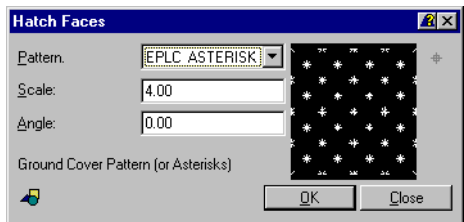




Figure 7-23 Hatch Faces Dialog Box

Hatch Faces Dialog Box Definitions

Option	Icon	Function
PIC		This icon allows you to define values by selecting points in the CAD graphic.
Pattern		Choose the pattern name from this drop list.
Scale		This value controls the scale of the hatch pattern. Smaller numbers make a more dense hatch.
Angle		This value controls the angle of the hatch pattern. Zero degrees is to the right.
Pattern Preview		This is a graphic display of the selected hatch pattern.
CAD Settings		This icon allows you to edit the layer/level, color, and linetype/linestyle of objects.

QuickSteps

1. **Select Tools → Hatch → Hatch Face.**

The Hatch Faces dialog box (Figure 7-23 on page 111) displays.

2. **From the Pattern drop list, select a hatch pattern.**
3. **In the Scale edit field, enter a scale for the pattern (e.g., .5).**
4. **In the Angle edit field, enter an angle (if desired) for the pattern, e.g., 45.**
5. **Click on OK.**

You are prompted to select the closed polyline defining the area to be hatched.

6. **Select a closed polyline.**

The selected area is hatched.

Example

The following is an example of the Hatch Faces command.

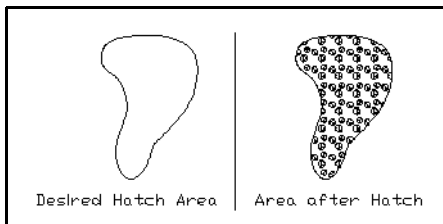


Figure 7-24 Hatch Area Example

Inquiry

IRRIGATION DESIGN ➤ TOOLS ➤ INQUIRY

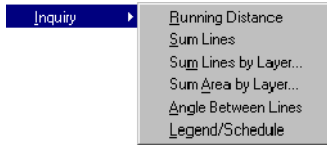


Figure 7-25 Inquiry Submenu

Running Distance

IRRIGATION DESIGN ➤ TOOLS ➤ INQUIRY ➤ RUNNING DISTANCE

KEY-IN COMMAND: `irsumrun`



The Running Distance command allows you to select multiple points in the CAD graphic and totals the distance for all points selected, as well as for each individual selection. This command is useful for finding the total distance of multiple objects, such as edging for planter beds.

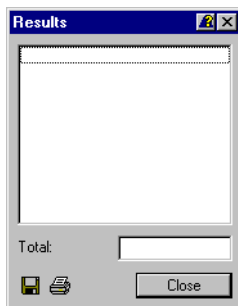




Figure 7-26 Running Distance Results Dialog Box

Running Distance Results Dialog Box Definitions

Option	Icon	Function
Selected Points		This is a listing of the selected points with the running distance for each point.
Total		The overall distance of the selected points is displayed in this edit field.

Running Distance Results Dialog Box Definitions

Option	Icon	Function
Save Disk to		This option allows you to save your output to a text file. You could keep this file on hand for reference.
Send to Printer		This option allows you to print your output to your configured printer.

QuickSteps

1. Select Tools → Inquiry → Running Distance.

The Running Distance Results dialog box (Figure 7-26 on page 113) displays. You are prompted to select a starting point.

2. Graphically select a starting point.

You are prompted to select the next point. Repeat this process until the desired number of points are selected.

3. When you are finished selecting points, press Enter.

The Running Distance Results dialog box displays each segment's running total, as well as the overall total.

Example

The following is an example of the Running Distance command.

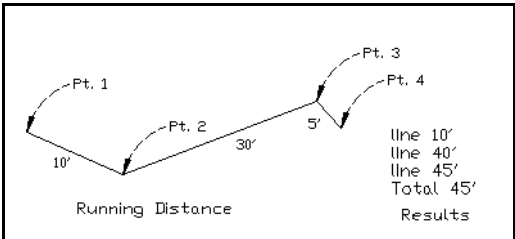


Figure 7-27 Running Distance Example

Sum Lines

IRRIGATION DESIGN ➤ TOOLS ➤ INQUIRY ➤ SUM LINES

KEY-IN COMMAND: `irsumline`

The Sum Lines command allows you to select multiple line segments, and then totals the distance for all segments, as well as for the individual segments. This command can be used for finding the total length of items in the CAD graphic represented by line segments, such as driveways or sidewalks.

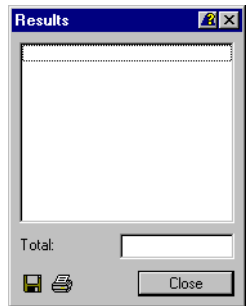




Figure 7-28 Sum Lines Results Dialog Box

Sum Lines Results Dialog Box Definitions

Option	Icon	Function
Line Segments		This is a listing of the selected line segments and their individual lengths.
Total		This value is the total distance of all selected lines.
Save to Disk		This option allows you to save your output to a text file. You could keep this file on hand for reference.
Send to Printer		This option allows you to print your output to your configured printer.

QuickSteps

- Select Tools → Inquiry → Sum Lines.**
You are prompted to select objects.
- Graphically select the desired line segments and press Enter.**
The number of line segments, a running total, and the total length display.

Example

The following is an example of the Sum Lines command.

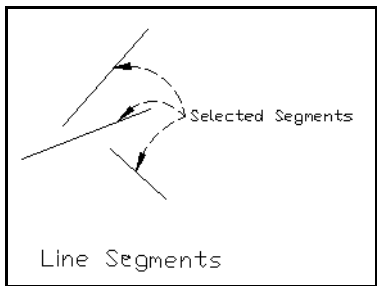


Figure 7-29 Sum Lines Example

Sum Lines by Layer/Level

IRRIGATION DESIGN ➤ TOOLS ➤ INQUIRY ➤ SUM LINES BY LAYER/LEVEL

KEY-IN COMMAND: `irsumlinelay`

The Sum Lines by Layer/Level command allows you to select an object on a layer/level and totals the line segments and polyline segments on the selected object's layer/level. This command is useful for totalling a large number of items on the same layer/level. This command minimizes the risk of missing an item to be totaled.

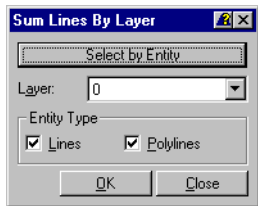


Figure 7-30 Sum Lines By Layer Dialog Box

Sum Lines By Layer Dialog Box Definitions

Option	Function
Select by Entity	This option allows you to select an item to set the layer/level.
Layer/Level	This is the layer/level you want to utilize for line/polyline length summaries.
Entity Type	<div>➡ Lines: Toggle on this option if you want to total the line segments on the selected object's layer/level.</div> <div>➡ Polylines: Toggle on this option if you want to total the polyline segments on the selected object's layer/level.</div>

QuickSteps

1. **Select Tools → Inquiry → Sum Lines by Layer/Level.**

The Sum Lines By Layer/Level dialog box (Figure 7-30 on page 116) displays.

2. **Select the entity type and layer/level. Click on OK.**

You are prompted:

Select object on layer/level to sum lines

3. **Graphically select an object on the desired layer/level and click on OK.**

The number and distance of each line/polyline segment display, as well as the total length.

Example

The following is an example of the Sum Lines by Layer/Level command.

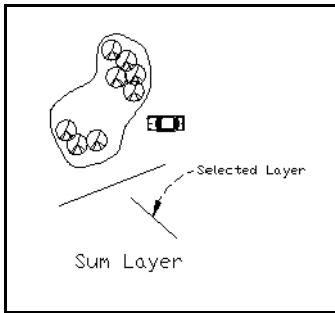


Figure 7-31 Sum Lines by Layer/Level Example

Sum Area by Layer/Level

IRRIGATION DESIGN → TOOLS → INQUIRY → SUM AREA BY LAYER/LEVEL

KEY-IN COMMAND: `irsumarea`

The Sum Area by Layer/Level command allows you to select an object on a layer/level and then totals the area of all closed polylines on the object's layer/level. This command is useful for finding the total area of all polylines on a selected layer/level, such as planter beds or turf areas.

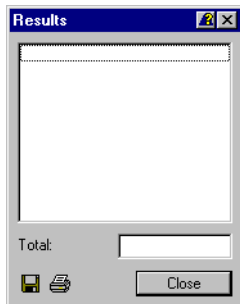




Figure 7-32 Sum Area by Layer/Level Results Dialog Box

Sum Area by Layer/Level Results Dialog Box Definitions

Option	Icon	Function
Area segments		This area lists all border length segments surrounding the area.
Total		This value is the total area of all areas enclosed by the selected border.
Save to Disk		This option allows you to save your output to a text file. You could keep this file on hand for reference.
Send to Printer		This option allows you to print your output to your configured printer.

QuickSteps

1. **Select Tools → Inquiry → Sum Area by Layer/Level.**

You are prompted:

Select object on Layer/Level to sum area

2. **Graphically select an object on the desired layer/level.**

The number, area, and perimeter of each closed polyline display in the Sum Area by Layer/Level Results dialog box (above), as well as the total area.

Example

The figure below shows an example of the Sum Area by Layer/Level command.

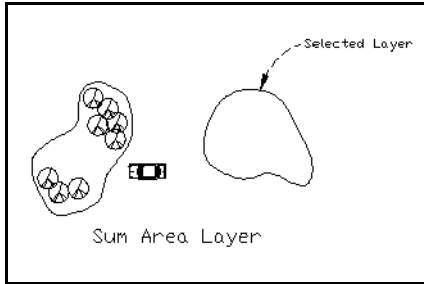


Figure 7-33 Sum Area by Layer/Level Example

Find Angle Between Lines

IRRIGATION DESIGN ⇨ TOOLS ⇨ INQUIRY ⇨ ANGLE BETWEEN LINES

KEY-IN COMMAND: `irangle`

The Angle Between Lines command allows you to select two line segments and gives the angle between the two selected lines.

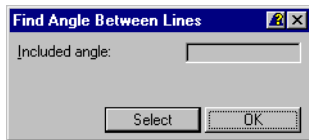


Figure 7-34 Find Angle Between Lines Dialog Box

Find Angle Between Lines Dialog Box Definition

Option	Function
Included angle	The angle between the two selected lines is reported in this edit field.

QuickSteps

1. **Select Tools → Inquiry → Angle Between Lines.**

The Find Angle Between Lines dialog box (Figure 7-34 on page 119) displays.

2. **Click on Select and graphically select the first line.**

3. **Graphically select the second line.**

The angle between the two lines displays in the Included angle edit field.

Example

The following is an example of the Angle Between Lines command.

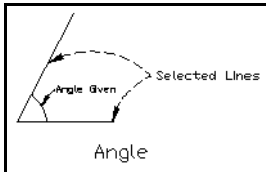



Figure 7-35 Angle Between Lines Example

Insert Legend

IRRIGATION DESIGN ➤ TOOLS ➤ INQUIRY ➤ LEGEND/SCHEDULE

KEY-IN COMMAND: `irlegend`

The Legend/Schedule command allows you to create a catalog list of selected items in the CAD graphic and have a graphic, as well as text notes, to describe the items. This command is useful for labeling areas that are not represented by plant material or irrigation heads, such as hatch patterns, benches, etc.

 Use this command to create a list of items in the CAD graphic that do not represent plant materials.

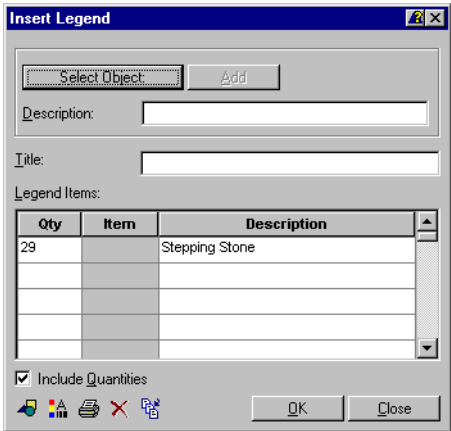







Figure 7-36 Insert Legend Dialog Box

Insert Legend Dialog Box Definitions

Option	Icon	Function
Select Object		This button allows you to pick an object in the CAD graphic to include in the legend.
Add		After you select the object in the CAD graphic, click on Add to add the object to the legend.
Description		Type a description to associate to the object in the legend.
Title		Type a title for your legend here.
Legend Items		<ul style="list-style-type: none"> ➤ Qty: This the number of occurrences of the selected object found in the CAD graphic. ➤ Item: This is a graphical representation of the selected object. ➤ Description: This is the user-defined description of an object.
Include Quantities		This option enables the program to count all identical objects, without the necessity of selecting each item individually.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.
Text Properties		This allows you to specify the text style and/or layer/level for the text to be placed in the CAD graphic.
Send to Printer		This icon allows you to print a legend.
Remove Item		This icon allows you to delete an item from the legend.

Insert Legend Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Insert into Drawing		This option allows you to insert the legend into the CAD graphic.

QuickSteps

1. Select Tools → Inquiry → Legend/Schedule.

The Insert Legend dialog box (Figure 7-36 on page 121) displays.

2. Type a description of a block/cell that exists in your CAD graphic (a non-plant), e.g., bench.

3. Click on the Select Object button and select this block/cell in your CAD graphic.

4. Click on the Add button.

5. Type a title for the legend and click on OK.

You are prompted to select the insertion point for the legend.

6. Graphically pick where the upper left corner of the legend is to be placed.

The legend is placed in the CAD graphic.

Example

The following is an example of a legend.





Legend		
Qty	Item	Description
5		Bench
		Cobble Stone
		Grass
2		Light Post

Figure 7-37 Legend Example

Layer

IRRIGATION DESIGN ⇨ TOOLS ⇨ LAYER/LEVEL

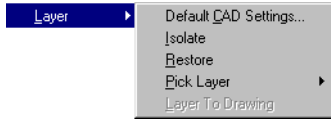


Figure 7-38 Layer Submenu



Default CAD Settings

IRRIGATION DESIGN ⇨ TOOLS ⇨ LAYER/LEVEL ⇨ DEFAULT CAD SETTINGS

KEY-IN COMMAND: `ircadset`



The Default CAD Settings command allows you to set the default CAD settings for the majority of the objects that are constructed. There is a treeview on the left of the dialog box that divides all of the objects that are constructed in CAD by product. The CAD settings appear to the right of the area for the item that is highlighted in the treeview.

-  *When changing any of the highlighted item's attributes, be sure to use the Apply button before highlighting another item in the treeview.*
-  *These can be created into a prototype to be used in a new project. Also included in a prototype are Units, Formats, Precision, Drawing/Design File Settings, and Layer/Level Groups.*

AutoCAD/IntelliCAD/Eagle Point Graphics Engine

AutoCAD/IntelliCAD/Eagle Point Graphics Engine contains the following settings: layer, color, linetype, width, override with active attributes, text units, plotted size/height, drawing scale, style, and use style's height.

MicroStation

MicroStation contains the following settings: level, color, linestyle, custom linestyle, weight, override with active attributes, text units, plotted size/height, design file scale, font, and use font's height.

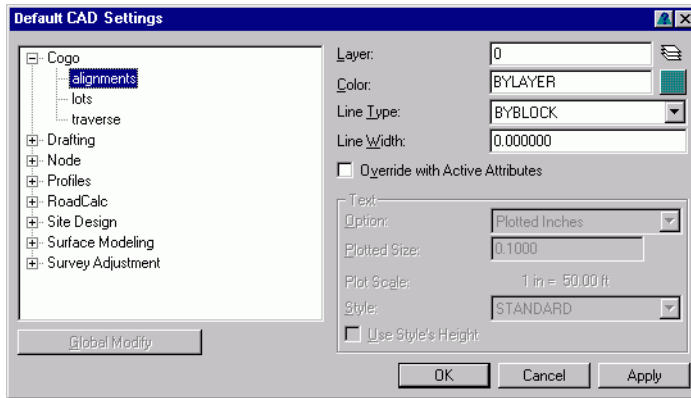



Figure 7-39 Default CAD Settings – AutoCAD/IntelliCAD/Eagle Point Graphics Engine Dialog Box

Default CAD Settings – AutoCAD/IntelliCAD/Eagle Point Graphics Engine Dialog Box Definitions

Option	Icon	Function
Tree view		This window lists all of the objects that are constructed in CAD, separated by product.
Global Modify		This option allows you to change the text size for all items that place text. It also changes the CAD settings to use the active attributes if Override with Active Attributes is toggled on.
Layer		Clicking on this icon allows you to select the layer. This value is the layer on which the object is constructed. You can also type a layer name directly in the edit field.
Color		This edit field lists the color with which the object is constructed. You can select the color by clicking on the color icon or by typing the color in the edit field.
Line Type		From this drop list choose the linetype with which the object is constructed.
Line Width		This value is the line width that is available for any object, and it creates a polyline when it is constructed.
Override with Active Attributes		This option disables the layer, color, linetype, and line width. The active symbology of the CAD engine is used when the object is constructed.
Option		This is the type of text option that is used. You can choose Leroy, Plotted Inches (Millimeters), Drawing Units, or Points from this drop list.
Plotted Size/Height		This value is the plotted size of the text if your text units are set to Leroy, Plotted Inches (Millimeters), or Points. Height is the text height if your text units are set to Drawing Units.
Plot Scale		This value is the horizontal scale of the current drawing.
Style		This drop list shows the text style that is used when text is placed into the drawing.
Use Style's Height		This option uses the height that is set for the text style by the CAD engine.

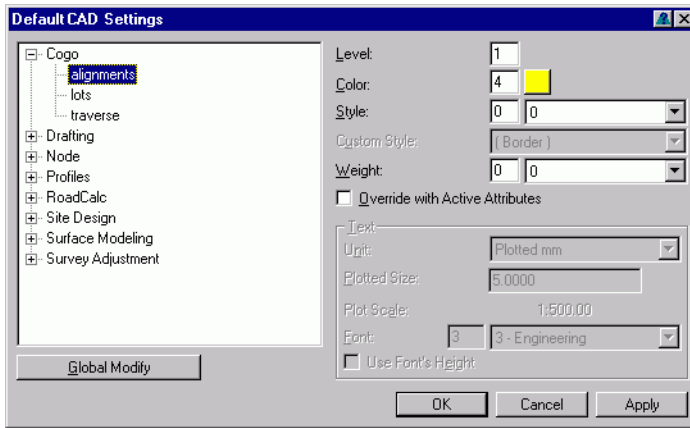


Figure 7-40 Default CAD Settings – MicroStation Dialog Box

Default CAD Settings – MicroStation Dialog Box Definitions


Option	Function
Tree view	This window lists all of the objects that are constructed in CAD, separated by product.
Global Modify	This option allows you to change the text size for all items that place text. It also changes the CAD settings to use the active attributes if Override with Active Attributes is toggled on.
Level	This value is the level on which the object is constructed.
Color	This is the color with which the object is constructed.
Style	This value is the linestyle with which the object is constructed. If this is set to Custom, you must enter a custom linestyle to be used.
Custom Style	This option is only available if you have set the style to be custom. This is the custom linestyle that is used for the object when it is constructed.
Weight	This is the weight that the text or object uses when it is constructed.
Override with Active Attributes	This disables the level, color, style, custom linestyle, and weight. The active symbology of the CAD engine is used when the object is constructed.
Unit	This drop list shows the type of text option that is used. You can choose Leroy, Plotted Inches (Millimeters), Drawing Units, or Points from this drop list.
Plotted Size/ Height	This edit field shows the plotted size of the text if your text units are set to Leroy, Plotted Inches (Millimeters), or Points. This is the height if your text units are set to Drawing Units.
Plot Scale	This displays the horizontal scale of the design file that you have open.
Font	This drop list shows the text font that is used when text is placed into the design file. The weight is also used when the text is placed.
Use Font's Height	This option uses the height that is set for the font by the CAD engine.

Isolate

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ ISOLATE

KEY-IN COMMAND: `irisolatelayer`

The Isolate command allows you to select an object and all other layers/levels are frozen/turned off except the selected object's layer/level. This command is extremely useful in working with areas that have a lot of information and detail. You can select this command, pick an individual layer/level, and that layer/level is the only one displayed. You can then make any modifications or changes to that layer/level when dealing with the other information nearby. When you are finished you can select Restore Layer/Level to return to the original layer/level settings.

 *Run the Restore Layer/Level command to return to the previous layer/level setting. If you select a layer/level other than the current layer/level to isolate, you receive the message "Cannot freeze current layer/level."*

QuickSteps

1. Select Tools → Layer/Level → Isolate.

You are prompted to select an object on the layer/level to isolate.

2. Graphically select the object on the desired layer/level.

All the layers/levels except for the selected layer/level are frozen/turned off.

Example

In the following example, a tree symbol was selected while running the Isolate command. The vehicles and house layers are frozen, so that only the trees are displayed.

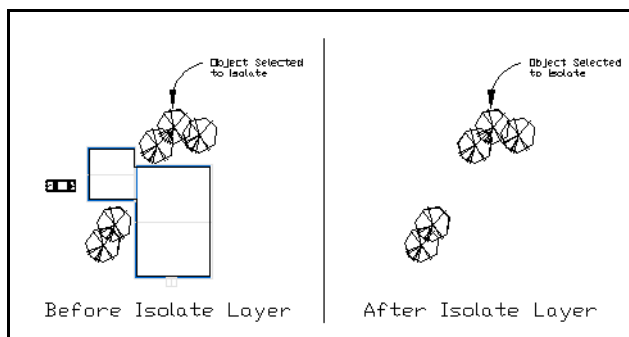



Figure 7-41 Isolate Layer/Level Example

Restore

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ RESTORE

KEY-IN COMMAND: `irreslayer`

The Restore command allows you to return layers/levels to the previous settings that were established before you ran the Isolate command. For example, you may have run the Isolate command to make modifications to the sidewalk layer/level; now that the modifications are complete you want to see how the changes affect the rest of the design. By running the Restore command, the previous layer/level settings are restored.

 You must run the Isolate Layer/Level command first. If you have not run the Isolate Layer/Level command, you receive a message that states “Must run Isolate Layer/Level command before using this command.”

Example

Selecting Restore Layer/Level thaws/turns on the layers/levels that were previously frozen/turned off using the Isolate command.

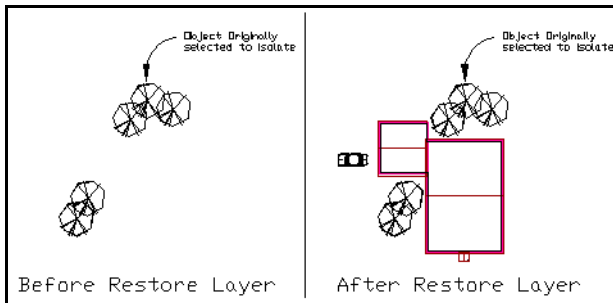


Figure 7-42 Restore Layer/Level Example

Pick Layer

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL

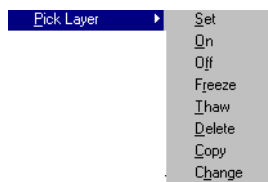


Figure 7-43 Pick Layer Submenu

Set

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ SET

KEY-IN COMMAND: `irlayset`

The Pick Layer/Level – Set command sets the working, or current layer/level, to the same as the object selected. For example, you may wish to work on the same layer/level that a light post is on, but cannot remember the layer/level name. Rather than taking the time to list the layer/level and then set to that layer/level, you can simply select the light post object in the CAD graphic.

QuickSteps

1. **Select Tools ➤ Layer/Level ➤ Pick Layer/Level ➤ Set.**

You are prompted to pick an object on the desired layer/level.

2. **Select an object that contains the desired layer/level and press Enter.**

You are prompted:

Current layer/level set to (selected object's layer/level).


The current layer/level becomes that of the object selected.

On

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ ON

KEY-IN COMMAND: `irlayon`

The Pick Layer/Level – On command turns on the layer/level that was previously turned off using Pick Layer/Level – Off. For example, you may have to run the Pick Layer/Level-Off command to turn off a selected layer/level. To view the layer/level, rather than having to pull up the layer/level control dialog box and remember which layer/level was turned off, you can simply select Pick Layer/Level – On and restore the layer/level.


 *You must first use the Pick Layer/Level - Off command. If you did not use Pick Layer/Level – Off first, you receive a message stating that no layers were previously turned off.*

Off

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ OFF

KEY-IN COMMAND: `irlayoff`

The Pick Layer/Level – Off command turns off the layer/level of the selected object. For example, you may wish to turn off the TREES layer/Level so that you can better see the shrub planting near the trees. Rather than having to remember what layer/level the trees are on and accessing the layer/level control dialog box, you can run the Pick Layer/Level – Off command.

 *Use the Pick Layer/Level – On command to reverse this command.*

QuickSteps

1. **Select Tools → Layer/Level → Pick Layer/Level → Off.**

You are prompted:

Select objects/Layers to turn off.

2. **Select the objects that have the layers/levels you wish to turn off and press Enter.**

The objects' layers/levels are turned off.

Freeze

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ FREEZE

KEY-IN COMMAND: `irlayfreeze`

The Pick Layer/Level – Freeze command freezes the layer/level of the selected object. This command's functions are similar to the Pick Layer/Level – Off command, except that the layer/level selected is not processed or displayed.

 *Use the Pick Layer/Level – Thaw command to reverse this command.*

QuickSteps

1. Select Tools → Layer/Level → Pick Layer/Level → Freeze.

You are prompted:

Select objects/Layers to freeze.

2. Select the objects that have the layer/level you wish to freeze and press Enter.


The selected layers/levels are frozen.

Thaw

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ THAW

KEY-IN COMMAND: `irlaythaw`


The Pick Layer/Level – Thaw command thaws the layer/level that was previously frozen using the Pick Layer/Level – Freeze command. This command functions similar to the Pick Layer/Level – On command, except that the selected layer/level not only is visible again, but it also is processed.

 *You must have previously frozen a layer/level using the Pick Layer/Level – Freeze command.*

Delete

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ DELETE

The Pick Layer/Level – Delete command deletes all objects on a specified layer/level. For example, you may have created a layer/level called CONSTRUCT that contains all of the construction lines for the design. Now that they are no longer needed, you can simply use this command to delete all of the objects on the CONSTRUCT layer/Level.

 *Be careful when using layer/level control throughout the drafting process so that you do not accidentally delete objects that should have been put on a different layer/level.*

QuickSteps

1. **Select Tools → Layer/Level → Pick Layer/Level → Delete.**

You are prompted:

This command will erase everything on the specified layer/level. Layer/Level to Delete:

2. **Type the layer/level name on which the objects that you wish to delete reside and press Enter.**

All entities on the specified layer/level are deleted.

Copy

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ COPY

KEY-IN COMMAND: `irlaycopy`

The Pick Layer/Level - Copy command copies all objects on a specified layer/level to another layer/level. For example, you may wish to have an exact copy of all the objects on the CONTOURS layer/Level so that you can retain the original objects on that layer/level, and still be able to modify the copied objects on another layer/level.

QuickSteps

1. **Select Tools → Layer/Level → Pick Layer/Level → Copy.**

You are prompted to select objects.

2. **Select the objects that you wish to copy to another layer/level and press Enter.**

You are prompted for the layer/level to which to copy.

3. **Type the layer/level name you wish to copy the objects to and press Enter.**

The selected objects are copied to the specified layer/level.

Example

The following is an example of the Pick Layer/Level – Copy command.

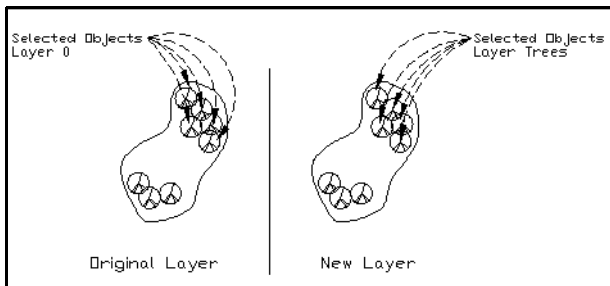


Figure 7-44 Copy Example

Change

IRRIGATION DESIGN ➤ TOOLS ➤ LAYER/LEVEL ➤ PICK LAYER/LEVEL ➤ CHANGE

KEY-IN COMMAND: `irlaychange`

The Pick Layer/Level – Change command changes the layer/level of selected objects to the layer/level of another selected object. For example, you may have forgotten to select the SIDEWALK layer/Level before drawing several sidewalks. This command can be used to select all the newly-drawn sidewalks and change to the SIDEWALK layer/Level by simply picking an object already on the SIDEWALK layer/Level.

QuickSteps

1. **Select Tools → Layer/Level → Pick Layer/Level → Change.**

You are prompted:

Select objects to be changed

2. **Select the objects that you wish to put on another layer/level and press Enter.**

You are prompted to pick an object on the desired layer/level.

3. **Select an object that is on the layer/level to which you wish to change.**

The selected objects are changed to that layer/level.

Lines

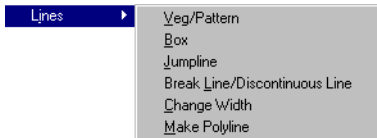


Figure 7-45 Lines Submenu

Draw Vegetation Line



KEY-IN COMMAND: `irvegline`

ICON: 

The purpose of a vegetation line is to illustrate the edges of large masses of plants, rather than showing individual plants. Trees are often shown as just an arc, while shrubs may be shown as either arcs or some type of jagged line. Ground covers can be expressed in many forms, including both a scalloped edge or jagged lines.

Each linetype is defined as a segment via a CAD block/cell. The beginning of a segment must exactly match the endpoint of a segment in order to get a resulting line. The blocks/cells are then exploded and a join is done to combine all the segments into a single line entry.

- ✎ Do not use a polyline that has been splined. Splining causes many additional vertices to be inserted. You only want a simple outline of the area to be represented by the vegetation line if you are converting an existing polyline. In most cases, picking points gives you better results.
- ✎ If using AutoCAD/IntelliCAD/**Eagle Point Graphics Engine**, be sure to use a standard polyline and not a lightweight polyline.

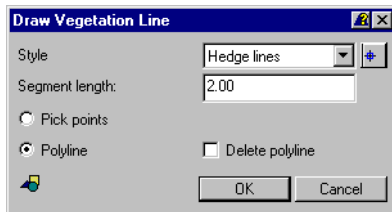


Figure 7-46 Draw Vegetation Line Dialog Box

Draw Vegetation Line Dialog Box Definitions



Option	Icon	Function
Style		You may choose from Hedge lines or Smooth Arcs from this drop list.
PIC		The PIC button allows you to pick the segment length points in the CAD graphic.
Segment length		The segment length is a distance multiplier. Since all linetypes are defined as a block/cell, this is essentially the X-scale factor.
Pick points		<p>This radio button allows you to graphically pick points as the vegetation line is being placed. This requires no existing lines.</p> <p>This option displays the Drafting Tool Bar (Figure 7-47 on page 135) to assist in the creation of vegetation lines.</p>
Polyline		This radio button allows you to utilize an existing polyline as the basis for the vegetation line.
Delete polyline		This option, used in conjunction with the Polyline option, automatically deletes the polyline once the vegetation line is placed.
CAD Settings		This option allows you to specify the color, layer/level, linetype/style, and line thickness.



Figure 7-47 Drafting Tool Bar

Drafting Tool Bar Definitions

Option	Icon	Function
Draw Line/ Draw Arc		Clicking on this icon allows you to draft a line or series of lines in your CAD graphic. A click on the icon will change the line that is being drawn from a line to a curve. This command eliminates the necessity of exiting the current command in order to place linework. The lines that are drawn are placed as polylines.
Undo		When utilizing the Draw Line command, the Undo command allows you to remove/delete the last section of line that was drawn. <i>This will only apply if you are still in the Draw Line command.</i>
Close Boundary		This command allows you to create a closed area by snapping the line from its current location back to the beginning point. <i>This option will only work if you are in the Draw Line/Draw Arc command.</i>

QuickSteps

1. Select Tools → Lines → Veg/Pattern.

The Draw Vegetation Line dialog box (Figure 7-46 on page 134) displays.

2. From the Style drop list, choose the style desired, either Hedge lines or Smooth Arcs.

3. Specify a distance for each segment in the Segment length edit field. You may type a value in the edit field, or click in the edit field and then on the PIC button and select the base point and end point in the CAD graphic.

4. Choose either Pick points or Polyline.

A. Pick Points: If you select Pick points, click on OK.

You are prompted to select points.

Select the points in the CAD graphic and press Enter when you are finished.

The vegetation line is drawn.

B. Polyline: If you select Polyline, specify if you want to delete the existing polyline and click on OK.

You are prompted to select the polyline.

C. Select the polyline in the CAD graphic.

The vegetation line is drawn.

Example

The following is an example of a vegetation line drawn by selecting a polyline and deleting the polyline.

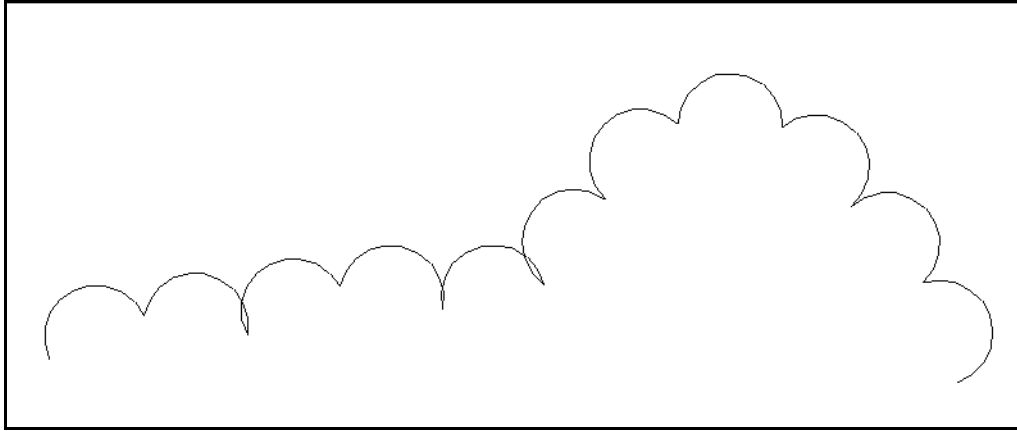


Figure 7-48 Veg/Pattern Command Example

Draw Box



KEY-IN COMMAND: `irbox`

The Box command allows you to specify two points and draw a box either as a series of line segments, a polyline, or a solid. For example, you may wish to have a simple square in the design to represent a shed. To accomplish this in CAD/MicroStation/**Eagle Point Graphics Engine** requires several steps. Running the Box command only requires two selections.

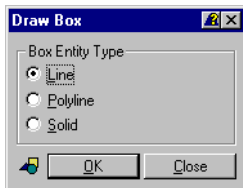



Figure 7-49 Draw Box Dialog Box

Draw Box Dialog Box Definitions

Option	Icon	Function
Box Entity Type		➤ Line: This option creates a box using your selection of diagonal points. The result is four line segments.
		➤ Polyline: This option creates a box using your selection of diagonal points. The result is one polyline.
		➤ Solid: This option creates a box using your selection of diagonal points. The result is a shaded, solid square.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

QuickSteps

1. Select Tools → Lines → Draw Box.

The Draw Box dialog box (Figure 7-49 on page 136) displays.

2. Select a box entity type, e.g., Polyline.

3. Click on OK.

You are prompted to select the first point.

4. Graphically select the desired location of the box corner.

You are prompted to select the next corner.

5. Graphically select the location of the opposite corner.

The box is drawn.

Example

The following is an example of placing a box by picking two points.

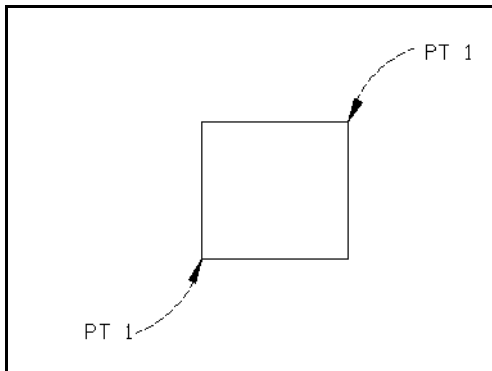


Figure 7-50 Draw Box Example

Insert Jump Line

IRRIGATION DESIGN ➤ TOOLS ➤ LINES ➤ JUMPLINE

KEY-IN COMMAND: `irjumpline`

The Jumpline command allows you to break an existing line or polyline and place an arc entity over the line that it crosses. This command is useful for representing a line that is displayed in 2-D, but in 3-D it is on top of the line it crossed.

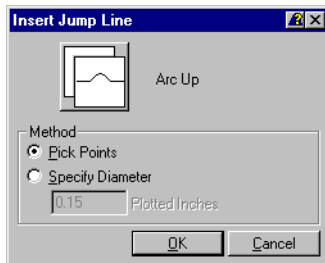


Figure 7-51 Insert Jump Line Dialog Box

Insert Jump Line Dialog Box Definitions

Option	Function
Arc Up/Arc Down	Use this icon toggle to indicate whether you would like the arc going up or going down. When you click on the icon, it changes from Arc Up to Arc Down and vice versa.
Pick Points	By selecting two points along a pipe, the software places an arc that fits between the points selected.
Specify Diameter	Selecting a diameter keeps the arcs uniform in size. Utilizing this method enhances the clarity of the CAD graphic. The size is based on the plot scales.

QuickSteps

With crossing breaklines in your design similar to the Before Jumpline section in Figure 7-52 on page 139, complete the following steps.

1. **Select Tools → Lines → Jumpline.**
2. **Select Arc Up/Down so that Arc Up is toggled on and click on OK.**
You are prompted to select a line or polyline that includes the jump arc.
3. **Graphically select the line.**
You are prompted to select a first point.
4. **Graphically select the starting point of the jumpline.**
It may be helpful to use a Near snap.

You are prompted for a next point.

5. Graphically select the end point of the jumpline.

The jumpline is placed in the CAD graphic.

Example

The following is an example of placing a jumpline at the intersection of two lines.

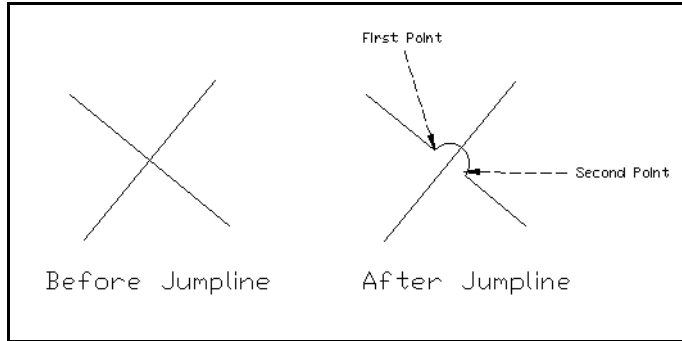



Figure 7-52 Jump Line Example

Place Discontinuous Line

IRRIGATION DESIGN ➤ TOOLS ➤ LINES ➤ BREAK LINE/DISCONTINUOUS LINE

KEY-IN COMMAND: `irdisline`

The Break Line/Discontinuous Line command allows you to represent a break line with either a zigzag or a curved line. This command is useful for representing the area on a CAD graphic that may continue on to another sheet, or to represent a distance that is longer than the distance displayed.

 Use this command to represent sheet breaks when plotting out multiple sheets, or to represent lines with longer-than-shown lengths, such as in creating details.

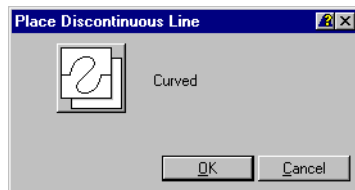



Figure 7-53 Place Discontinuous Line Dialog Box

Place Discontinuous Line Dialog Box Definition

Option	Function
Curved/Zigzag	Select the desired type of discontinuous line by clicking on the icon toggle.

QuickSteps

1. **Select Tools → Lines → Break Line/Discontinuous Line.**
2. **Select either Curved or Zigzag by clicking on the icon toggle and click on OK.**
You are prompted to select a line or polyline.
3. **Graphically select the desired line to break.**
You are prompted to select a first point.
4. **Graphically select the starting point of the break.**

 *You may find a Near snap helpful.*

You are prompted for a next point.

5. **Graphically select the ending point for the break.**
The discontinuous line is drawn.

Example

The following is an example of placing either a curved or zigzag line to represent a discontinuous line.

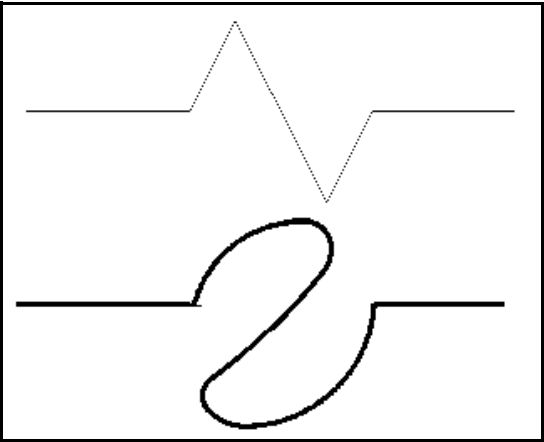


Figure 7-54 Discontinuous Line Example

Change Width

IRRIGATION DESIGN ➤ TOOLS ➤ LINES ➤ CHANGE WIDTH

KEY-IN COMMAND: `irchangewidth`

The Change Width command allows you to change the width of single or multiple polyline segments. For example, you may have several polylines in the CAD graphic that represent houses and sheds. These polylines would look better if they were a thicker width. With this command you can select all of the buildings and change their widths to the same new width regardless of their previous widths.



Figure 7-55 Change Width Dialog Box

Change Width Dialog Box Definitions

Option	icon	Function
New Width		Enter the desired width for the selected segments in this edit field.
Old Width		This field displays information concerning the current width of the polyline to be changed.
PIC		The PIC button allows you to specify the new width by selecting points in CAD.

QuickSteps

1. **Select Tools ➔ Lines ➔ Change Width.**
You are prompted to select objects.
2. **Graphically select the polylines for which you wish to change the width.**
3. **Press Enter.**
4. **Enter the desired width in the New Width edit field.**
5. **Click on Apply.**

The selected segments display the new width.

Example

The figure below is an example of changing the width of several polylines.

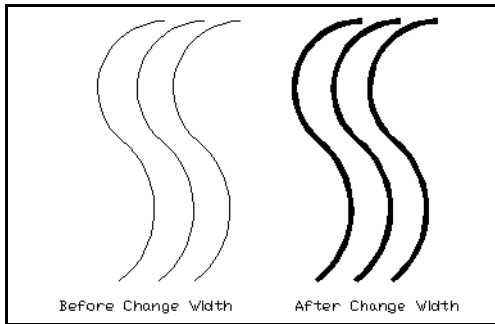


Figure 7-56 Width Example

Make Polyline

IRRIGATION DESIGN ➤ TOOLS ➤ LINES ➤ MAKE POLYLINE

KEY-IN COMMAND: `irmakepoly`

The Make Polyline command creates a single polyline from a number of line, arc, and polyline segments. For example, you may have an area around a house on which you wish to run the Auto Locate Head command. This command requires a closed polyline, but you may have created the driveway out of a polyline and the sidewalk out of line segments. Rather than having to redraw the entire area, you can use this command to convert the existing lines into a polyline.

QuickSteps

1. Select Tools → Lines → Make Polyline.
2. Select the objects that you wish to turn into a polyline. Right click when finished.

The selected objects are converted into a single polyline.

Example

The figure below is an example of turning a line, arc, and polyline into a single continuous polyline.

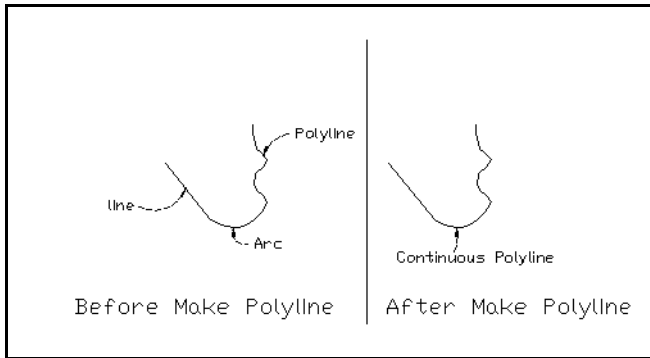


Figure 7-57 Make Polyline Example

Insert Border

IRRIGATION DESIGN ➤ TOOLS ➤ INSERT BORDER

KEY-IN COMMAND: `irinsertborder`



The Insert Border command allows you to place a border in your CAD graphic. You can select the symbol, orientation, and rotation angle for the border.

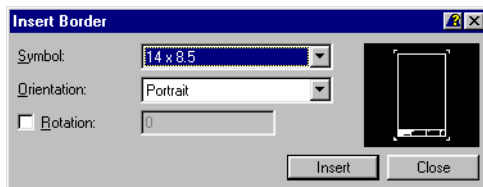


Figure 7-58 Insert Border Dialog Box

Insert Border Dialog Box Definitions

Option	Function
Symbol	Select predrawn title block symbols from this drop list.

Insert Border Dialog Box Definitions

<i>Option</i>	<i>Function</i>
Orientation	Select either Landscape or Portrait orientation from this drop list.
Rotation	This option indicates the rotation angle for the title block once it is inserted. You can toggle on Rotation and specify the rotation angle in the edit field or toggle off Rotation and specify the rotation angle of the border when it is inserted.

Text

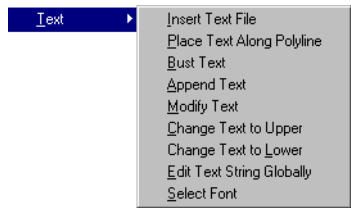
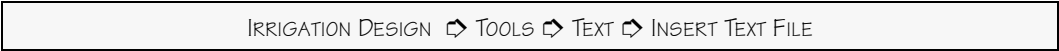



Figure 7-59 Text Submenu

Insert Text File



KEY-IN COMMAND: `irtextfile`

The Insert Text File command allows you to insert a block of ASCII text into the CAD graphic. This command is useful when you have large blocks of text such as planting specifications that need to be placed in the CAD graphic. It is much faster to type large text items in a word processing package rather than doing it in CAD.

 When creating large blocks of text in a word processing package, you must use the **Save As** option and select **ASCII (DOS) text**. Any custom fonts or settings are lost. The text is inserted according to the current text style settings.

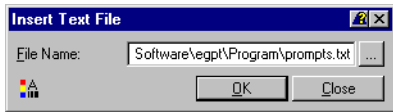




Figure 7-60 Insert Text File Dialog Box

Insert Text File Dialog Box Definitions

Option	Icon	Function
File Name		Enter the path and file name of the text file or click on the Browse icon to browse for the file.
Text Properties		This option allows you to specify the text style and/or layer/level for the text to be placed in the CAD graphic.

QuickSteps

- Select Tools → Text → Insert Text File.**
The Insert Text File dialog box (above) displays.
- Type the name and path of the desired file or click on the Browse icon to select the file.**
- Click on OK.**
You are prompted:
Locate starting point
- Graphically select the desired insertion point.**
The text file is inserted into the CAD graphic.

Example

This is an ASCII text file that was created using the Write Lot Legal command, then inserted using the Insert Text File command.

```
Beginning at a point;  
thence S 86°06'09" E  
a distance of 38.01' to a point  
around a curve to the left  
through a central angle of 105°30'39"  
an arc distance of 46.16'  
a chord bearing of N 01°14'14" W  
a distance of 39.91' to a point  
thence N 53°59'34" W  
a distance of 27.34' to a point  
thence S 44°24'42" W  
a distance of 38.18' to a point  
thence S 24°16'11" E  
a distance of 28.65' to a point  
to the Point of Beginning  
Containing 2251.3661 square feet or  
0.0517 acres more or less.
```


Figure 7-61 Insert Text File Example

Place Text On Polyline

IRRIGATION DESIGN ➤ TOOLS ➤ TEXT ➤ PLACE TEXT ALONG POLYLINE

KEY-IN COMMAND: `irpolytext`

The Place Text Along Polyline command allows you to enter a text string and have it follow the path of a polyline. This command can be used if you have a need for text strings that do not follow a straight path. If you have a trail winding through a grove of trees, placing a straight piece of text to label the trail would encroach on the tree symbols. By using the Place Text Along Polyline command, you can label the path.

 *The text that appears on the polyline is in individual text entities, so if you want to edit the text string at a later time, you may wish to erase the entire string and redo it.*

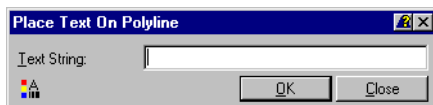



Figure 7-62 Place Text On Polyline Dialog Box

Place Text On Polyline Dialog Box Definitions

Option	Icon	Function
Text String		Enter the text to be placed along the selected polyline.
Text Properties		This option allows you to specify the text style and/or layer/level for the text to be placed in the CAD graphic.

QuickSteps

1. Select Tools → Text → Place Text Along Polyline.

The Place Text On Polyline dialog box (Figure 7-62 on page 146) displays.

2. Type the desired text in the Text String edit field.

3. Click on OK.

You are prompted to select the polyline(s) on which to place the text.

4. Graphically select the desired polyline(s).

The text is placed along the selected polyline(s).

Example

The following is an example of placing a text string along an existing polyline.

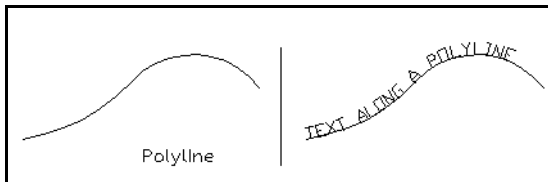



Figure 7-63 Place Text Along Polyline Example

Bust Text

IRRIGATION DESIGN ⇨ TOOLS ⇨ TEXT ⇨ BUST TEXT

KEY-IN COMMAND: `irbusttext`

The Bust Text command allows you to break a single text string into two separate text strings. This command is useful if a text string is too long to fit on a single line and you wish to put it on a different line.

 This command is extremely useful for editing large blocks of text that have been imported using the Import Text File command.

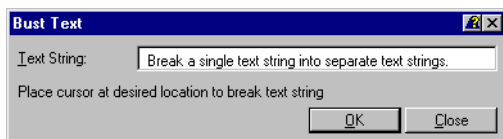


Figure 7-64 Bust Text Dialog Box

Bust Text Dialog Box Definition

Option	Function
Text String	Displayed in this edit field is the selected text string. Place the cursor at the point to break the text string.

QuickSteps

1. Select Tools → Text → Bust Text.

You are prompted to select text (object).

2. Graphically select the piece of text you wish to bust and press Enter.

The selected text appears in the Bust Text dialog box (above).

You are prompted to select the location of the broken piece of text.

3. In the Text String edit field, click at the location on the text string that you wish to break. Click on OK.

The text is broken from the original text string and placed at the specified location.

You are left with two strings to position as desired.

Example

The following is an example of breaking a single text string into two segments.

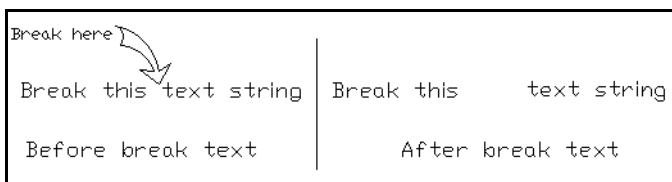



Figure 7-65 Bust Text Example

Append Text

IRRIGATION DESIGN ➤ TOOLS ➤ TEXT ➤ APPEND TEXT

KEY-IN COMMAND: `irappendtext`

The Append Text command allows you to join two separate text strings into a single text string. This command can be used in conjunction with the Insert Text File command. Large pieces of text can be broken using the Bust Text command and then joined with another line of text using the Append Text command.

 *This command is extremely useful for editing large blocks of text that have been imported using the Import Text File command.*

QuickSteps

1. **Select Tools → Text → Append Text.**

You are prompted to select text.

2. **Graphically select the piece of text you wish to append and press Enter.**

You are prompted to select the text to append.

3. **Graphically select the piece of text to be added.**

The selected text is added to the original text.

Example

The following is an example of joining two text strings into a single line of text.

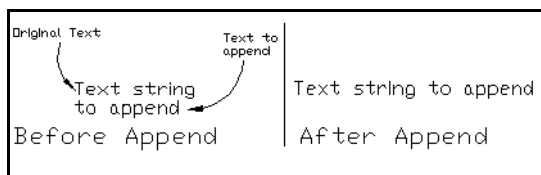


Figure 7-66 Append Text Example

Modify Text

IRRIGATION DESIGN ➤ TOOLS ➤ TEXT ➤ MODIFY TEXT

KEY-IN COMMAND: `iredittext`

The Modify Text command allows you to modify several aspects of the text. For example, you may have inadvertently used the wrong text style and height for a piece of text. Typically you would have to erase and retype the text string. With this command, you can just modify the appropriate settings.

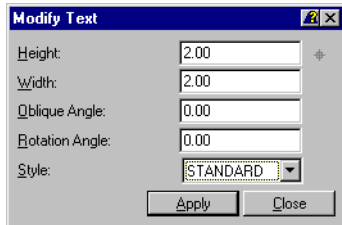



Figure 7-67 Modify Text Dialog Box

Modify Text Dialog Box Definitions

Option	Icon	Function
PIC		Clicking on this icon allows you to change the height, width, oblique angle, and rotation angle of the text by selecting points in CAD.
Height		Enter a value in this edit field to change the height of the selected text string.
Width		Enter a value in this edit field to change the width of the selected text string.
Oblique Angle		Enter a value in this edit field to change the oblique angle of the selected text string.
Rotation Angle		Enter a value in this edit field to change the rotating angle of the selected text string.
Style		Enter a value in this edit field to change the style of the selected text string.

QuickSteps

1. Select Tools ➤ Text ➤ Modify Text.

You are prompted to select text.

2. Graphically select the text to be modified.

The Modify Text dialog box (above) displays with the current text settings in the appropriate edit fields.

3. Change the desired settings.

4. Click on Apply.

The selected text updates to reflect the changes.

Example

The following are examples of changing the height, width, oblique angle, rotation angle, and style of a text string.

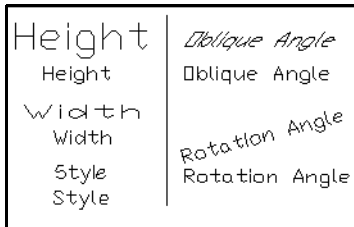


Figure 7-68 Modify Text Example

Change Text to Upper

IRRIGATION DESIGN ➤ TOOLS ➤ TEXT ➤ CHANGE TEXT TO UPPER

KEY-IN COMMAND: `irtoupper`

The Change Text to Upper command allows you to change the case of an entire text string to upper case. For example, you may have a piece of text that has already been typed in the CAD graphic, and then decided that the piece of text needed to have more attention called to it by making it all upper case. This command easily accomplishes this. This command can also be used to reverse the Change Text to Lower command.

Change Text to Lower

IRRIGATION DESIGN ➤ TOOLS ➤ TEXT ➤ CHANGE TEXT TO LOWER

KEY-IN COMMAND: `irtolower`

The Change Text to Lower command allows you to change the case of an entire text string to lower case. For example, you may have inadvertently capitalized a word or two in the middle of a sentence. Rather than retyping this string or editing each individual word, the Change Text to Lower command can be used. This command can also be used to reverse the Change Text to Upper command.

QuickSteps

1. **Select Tools → Text → Change Text to Lower.**

You are prompted to select text.

2. **Graphically select each piece of text you wish to change and press Enter.**

The selected pieces of text are changed to all lower case letters.

Example

The following is an example of changing an entire text string to either all upper case or all lower case.

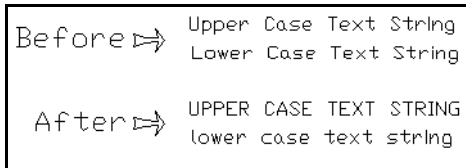


Figure 7-69 Change Text String to Upper/Lower Example

Edit Text String Globally

IRRIGATION DESIGN ➡ TOOLS ➡ TEXT ➡ EDIT TEXT STRING GLOBALLY

KEY-IN COMMAND: `irglobaltext`

The Edit Text String Globally command allows you to make changes to multiple pieces of the same text. For example, if Acer Rubrum is misspelled throughout a design, this command can be used to correct the spelling for all its occurrences in the CAD graphic.


 *Use the Edit Text String Globally command to change misspelled text strings that occur multiple times in the CAD graphic.*



Figure 7-70 Edit Text String Globally Dialog Box

Edit Text String Globally Dialog Box Definitions

Option	Function
Old String	This edit field displays the original text string to be modified.
New String	This edit field shows how the text should look after modification.

QuickSteps

- 1. Select Tools → Text → Edit Text String Globally.**
The Edit Text String Globally dialog box (Figure 7-70 on page 152) displays.
- 2. In the Old String edit field, enter the original text.**
- 3. In the New String edit field, type the text as it should appear.**
- 4. Click on Apply.**
All occurrences of the old text string are modified to the new string.

Example

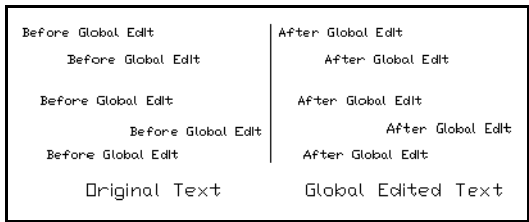
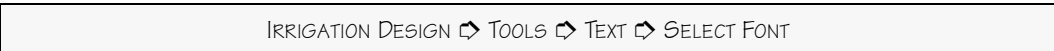


Figure 7-71 Edit Text String Globally Example

Select Font



KEY-IN COMMAND: `irfont`



The Select Font command allows you to change the current font style to another style.


-  When selecting a new font it is usually a good idea to take all of the default settings including the default text height. You can then change the text height from within the specified command.



Figure 7-72 Select Font Dialog Box

Select Font Dialog Box Definition

<i>Option</i>	<i>Function</i>
Font Styles	Select the desired font style from this drop list.

QuickSteps

- 1. Select Tools → Text → Select Font.**

The Select Font dialog box (above) displays.

- 2. Select the desired font type from the drop list and click on OK.**
- 3. Choose the defaults on any remaining prompts by pressing Enter each time.**

The current font is now the selected style.

-  Only fonts (styles) loaded in your CAD session are available for setting here.

Example



Figure 7-73 Select Font Example

Utilities

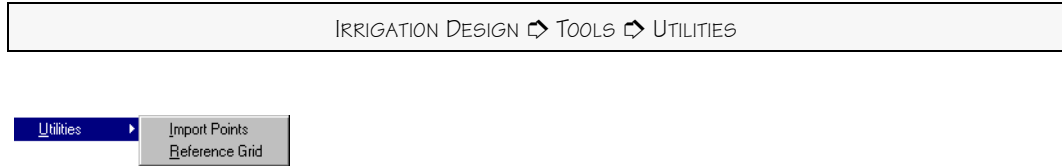


Figure 7-74 Utilities Submenu

Import File



KEY-IN COMMAND: `irimportpts`

The Import Points command allows you to bring in an ASCII file (DOS text file) in several different formats and convert them to CAD points. An example would be if you have a survey data file that is in Easting, Northing, and Elevation format and you wish to display the information in Northing, Easting, and Elevation (required by **Surface Modeling**).

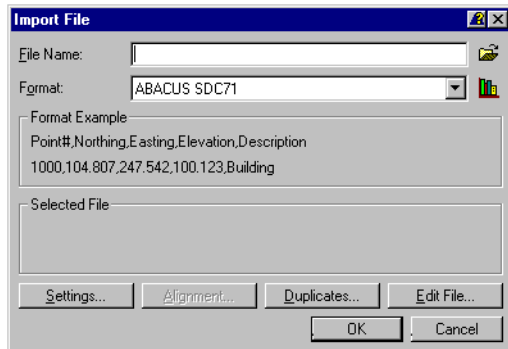




Figure 7-75 Import File Dialog Box

Import File Dialog Box Definitions

Option	Icon	Function
File Name		Type the path and file name of the ASCII point file in this edit field. You can click on the Select File to Import icon to display the standard Select File dialog box to locate a file.
Select File to Import		This icon allows you to select the ASCII point file.
Format		You may select the format to be used to import the selected file from this drop list.
Select File Format		This option allows you to select from a variety of point file formats.
Format Example		This field displays a sample format that the ASCII file needs to be imported. A description of each part of the format, as well as an example, are given. The format can be comma or space delimited and the description is optional.
Selected File		This displays the first line of the selected file to be imported. The first line should match the format example. If it does not, the file cannot be imported.
Settings		Click on this button to make modifications to the import file settings, such as how to place the objects in the CAD graphic, the Default Field Code, a Node ID value to add to the file, and a specific range of point numbers and/or elevations.
Alignment		This option allows you to select an alignment to import the data along. This option is available for cross-sectional formats.
Duplicates		This lists any of the Nodes being transferred that create more than one occurrence in the project.
Edit File		You may edit the selected file before importing it. To select a text editor, first click on the Settings button and choose WordPad or Notepad or specify a different text editor.

QuickSteps

1. Select Tools → Utilities → Import Points.

The Import File dialog box (Figure 7-75 on page 155) displays.

2. Click on the Select File to Import icon, select a file from the Select File dialog box, and click on Open, or type the path and file name of the file to import and press Enter.

A sample from the selected file displays in the dialog box.

3. Click on the Select File Format icon and select a format to use as an import filter from the list of supported formats.

4. Click on OK.

A sample of the selected format and the file selected shows so that you can compare to make sure that the format matches that of the file selected.


5. Click on the **Settings** button and make the necessary changes to the import settings.
6. Click on **OK**.
7. Check for any duplicate occurrences between the file and the project by clicking on the **Duplicates** button.
8. Click on **Close**.
9. Click on the **Edit File** button and edit the file in the text editor.
10. Save the file that was edited and exit the editor.
11. Click on **OK** to import the data.

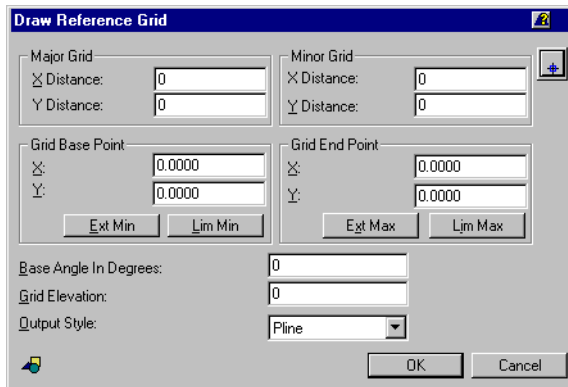
Draw Reference Grid

IRRIGATION DESIGN ➤ TOOLS ➤ UTILITIES ➤ REFERENCE GRID

KEY-IN COMMAND: `irrefgrid`

The Reference Grid command allows you to lay out a reference grid on the site. The reference grid can be used to locate items in the CAD graphic. For example, suppose you went to the site and took spot elevations every ten feet. You could use the Reference Grid command to lay out a 10 x 10 grid in the CAD graphic. Once the grid is in the site, you could use the Spot Elevation command to represent the elevations taken in the field and simply select the intersection of the lines on the reference grid. This command is also useful for contractors who measure items on site with a tape measure and then approximate their locations in the CAD graphic. After you select Reference Grid from the Utilities submenu (Figure 7-74 on page 155), the Draw Reference Grid dialog box (Figure 7-76 on page 158) displays.



 The grid is placed on locked layers/levels so you may use editing commands like Copy and Erase without affecting the placement of the grid.



The dialog box is titled "Draw Reference Grid". It contains several input fields and buttons. On the top right is a PIC button (a square with a crosshair). The "Major Grid" section has "X Distance:" and "Y Distance:" fields, both set to 0. The "Minor Grid" section also has "X Distance:" and "Y Distance:" fields, both set to 0. The "Grid Base Point" section has "X:" and "Y:" fields, both set to 0.0000, with "Ext Min" and "Lim Min" buttons below. The "Grid End Point" section has "X:" and "Y:" fields, both set to 0.0000, with "Ext Max" and "Lim Max" buttons below. At the bottom, there is a "Base Angle In Degrees:" field set to 0, a "Grid Elevation:" field set to 0, an "Output Style:" dropdown menu set to "Pline", and "OK" and "Cancel" buttons.

Figure 7-76 Draw Reference Grid Dialog Box

Draw Reference Grid Dialog Box Definitions

Option	Icon	Function
PIC		The PIC button allows you to select points for the grid distances, base points, and base angle in the CAD graphic.
Major Grid – X Distance, Y Distance		These values are the distances in the X and Y-directions that the major grid follows.
Minor Grid - X Distance, Y Distance		These values are the distances in the X and Y-directions that the minor grid follows. This is a grid within a major grid square. See Figure 7-77 on page 159.
Grid Base Point - X and Y		These values are the starting points for the grid.
Grid End Point - X and Y		These values are ending points for the grid.
Ext Min		These are the base and ending points of the grid to assume the current setting for the CAD graphic extents.
Lim Min		These are the base and ending points of the grid to assume the current settings for the CAD graphic limits.
Base Angle in Degrees		This value is the rotation of the grid off the base angle (typically 0 is to the right).
Grid Elevation		This value is the height, or Z-coordinate that the grids are drawn at.
Output Style		This drop list displays the type of entity of which the grid is composed. It is either polyline or mesh.
CAD Settings		This icon allows you to specify the color, layer/level, linetype/style, and line thickness.

QuickSteps

1. **Select Tools → Utilities → Reference Grid.**

The Draw Reference Grid Dialog box (Figure 7-76 on page 158) displays.

2. **Enter the desired numbers in the Major and Minor Grid X and Y Distance edit fields, e.g., 100, 10, respectively.**
3. **Click on the CAD Settings icon and change your layer/level to Grid. If Grid is not a choice, make one in the last edit field.**
4. **Change your Grid Base Points and your Grid End Points, e.g., (0, 0 and 500, 500).**
5. **Select an Output Style, e.g., Polyline.**
6. **Click on OK.**

The grid entities are placed in the CAD graphic.

Example

The example below is a reference grid that has a Major Grid X and Y of 10' and a Minor Grid X and Y setting of 1'. The base angle has been changed to 45 degrees.

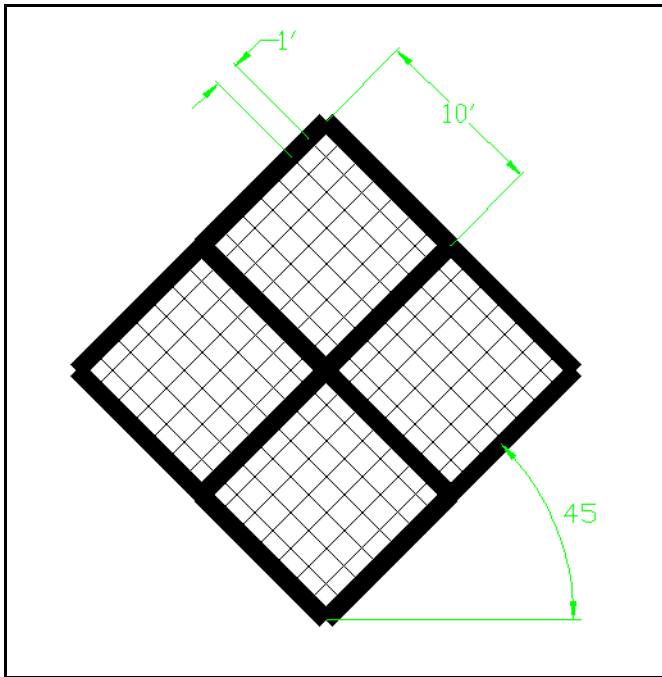


Figure 7-77 Draw Reference Grid Example

Presentation

IRRIGATION DESIGN ➤ TOOLS ➤ PRESENTATION




Figure 7-78 Presentation Submenu

Create Perspective

IRRIGATION DESIGN ➤ TOOLS ➤ PRESENTATION ➤ PERSPECTIVE VIEW

KEY-IN COMMAND: `irperspective`

The Perspective View command allows you to take a CAD graphic with 3-D entities in it and display them in a perspective view. For example, you may have created a 3-D CAD graphic and wish to show the plan to the client who is not versed in reading plan CAD graphics. You can simply run the Perspective View command to give the client a graphic representation of how the site may look once it is built. The Block Substitution command works well when combined with the Perspective View command.

 Enter a value in the Z coordinate field under Observers Location, such as 30, to get a “bird’s eye” view of the site.

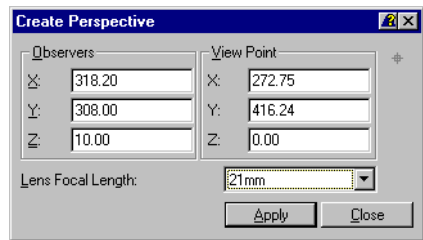



Figure 7-79 Create Perspective Dialog Box

Create Perspective Dialog Box Definitions

Option	Icon	Function
PIC		The PIC button allows you to change the observer's location and viewpoint by selecting points in CAD.

Create Perspective Dialog Box Definitions

<i>Option</i>	<i>Icon</i>	<i>Function</i>
Observers		The values in these edit fields represent the coordinates from which an observer is standing.
View Point		The values in these edit fields represent the coordinates toward which the observer is looking.
Lens Focal Length		This value is based on a camera lens. The value selected from the drop list indicates the distance to the right and left that the view encompasses from the Observers Location.

QuickSteps

1. **Select Tools → Presentation → Perspective View.**

The Create Perspective dialog box (Figure 7-79 on page 160) displays.

2. **Select the Lens Focal Length (e.g., 24mm).**
3. **Place focus in the X edit field under Observers.**
4. **Click on the PIC button.**
5. **Graphically select where you wish to be standing.**
6. **Place focus in the X edit field under View Point.**
7. **Click on the PIC button.**
8. **Graphically select the point to which you want to look.**
9. **Click on Apply.**

The current view is turned into a perspective view.

Examples

The following is an example of perspective variables.

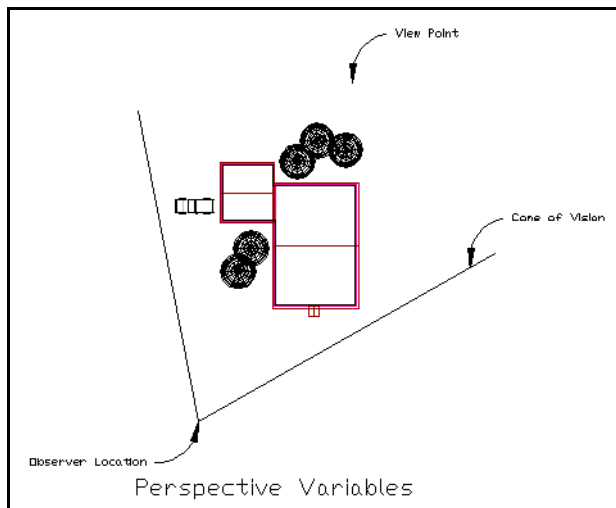


Figure 7-80 Perspective Variables Example

The figure below is an example of perspective and hide.

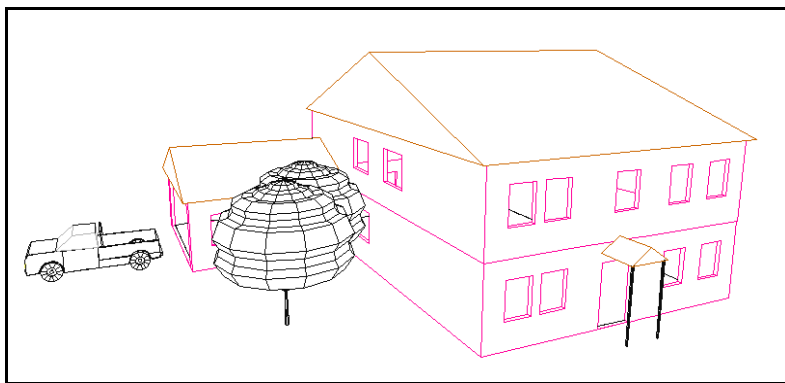



Figure 7-81 Create Perspective and Hide Example

Create Elevation

KEY-IN COMMAND: `irelevation`

The Elevation View command allows you to view a CAD graphic with 3-D entities in elevation view. This command is useful for converting a 3-D CAD graphic into an elevation view without having to use complicated UCS commands. An elevation view is essentially looking at a sight straight on, or rotating a plan view a full 90 degrees in the height, or Z, value.

 You must have two polylines in the CAD graphic before running this command: the first at the front of the desired elevation, and the second polyline at the back of the desired elevation. The elevation lines do not have to be parallel to each other.

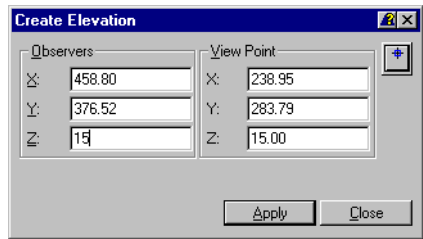



Figure 7-82 Create Elevation Dialog Box

Create Elevation Dialog Box Definitions

Option	Icon	Function
Observers		The values in these edit fields represent the coordinates from which an observer is standing.
View Point		The values in these edit fields represent the coordinates toward which the observer is looking
PIC		Clicking on this icon allows you to define the needed values by selecting points within the CAD graphic.

QuickSteps

- Select Tools → Presentation → Elevation View.**
You are prompted to select the polyline to use for the front of the elevation.
- Graphically select the polyline and press Enter.**
You are prompted to select the polyline to use for the rear of the elevation.

3. Graphically select the polyline and press Enter.

The CAD graphic is displayed in elevation view.

Examples

The following is an elevation variables example.

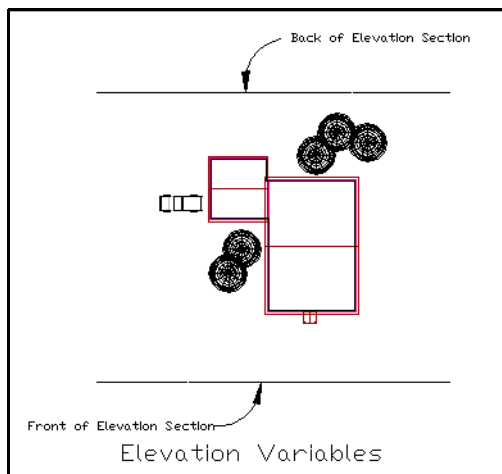


Figure 7-83 Elevation Variables Example

The figure below shows an elevation view example.



Figure 7-84 Elevation View Example

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